

## TURBOCHARGING HIGHWAY SEDIMENT CONTROL

### Baffle installation done right



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The first time I experienced a turbocharged engine was around second or third gear on my friend's four-cylinder, five-speed "import" more than 20 years ago; the desire for a little extra kick was just what I needed to pass another car on that long, straight stretch of road. You can get a similar extra kick with the installation of baffles in sediment basins used on linear highway projects.

For decades, the tool of choice for most sediment control structures on highway construction jobs has been rock. Whether in the form of rock check dams as velocity checks or rock outlet measures in traps and basins, the sediment-trapping efficiency of these types of measures has been less than optimal.

Research conducted at North Carolina State University over the past few years indicates that baffles installed in series in a sediment basin greatly improve sediment capture. Two to three baffles spaced evenly throughout a basin reduce flow velocities by utilizing the entire basin cross section, thus facilitating gravitational settling. The preferred baffle material is that of 20-oz/sy-weight coir fiber. The objective is not to provide a lengthy flow path for the runoff throughout the basin; it is to arrest the hungry sediment-laden water's energy and facilitate settling.

Proper installation of baffles is key to their effectiveness and success. For the best results, coir fiber is draped from a nine-gauge tensioned wire attached to metal T-posts on 4-ft spacing. The coir is stapled into the basin floor and tightly anchored to the basin side slopes. Generally, a 3-ft-high baffle is adequate, but the baffle should not exceed the elevation of the basin's emergency spillway or outlet weir.

The first cell in a basin with baffles serves as a forebay and accumulates the majority of sedimentation. Second or subsequent cells act as emergency backup in the event of up-gradient baffle failure and provide the quiescent zones for enhanced settling prior to discharge, preferably via a surface-skimming outlet device.

Because most highway construction sites involve excavation into subsoils or the introduction of soil "borrow" materials, colloidal clays frequently are encountered. Coir fiber baffles alone will have little to no impact on turbid suspended clays in storm water runoff, based on university research.

Passive treatment systems that introduce flocculants into runoff can be beneficial in turbidity control and in addressing proposed effluent limits on roadway and bridge projects. Polyacrylamide can be introduced up-gradient of the basin via fiber check dams (wattles) or on natural-fiber "wrapped" rock check dams. As treated runoff water enters a sediment basin, baffles can enhance flocculation by trapping additional suspended sediment and, thus, reducing turbidity levels. **[SWS]**

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