



USDA-CSREES 2006 National Water Quality Conference

Methods: Effects of Rock Cross Vane Geometry on Flow Conditions and Potential Failure

A commonly used stream restoration practice in North Carolina is the installation of rock cross vanes to maintain grade, stabilize banks and develop a downstream pool. The vanes serve to allow a step down in the bed of the stream and turn water away from the banks towards the center of the stream. The drop and the increased velocity at the center help in scour pool establishment. The design specifications for rock cross vane installation in North Carolina stream restoration projects are generally accepted to be a 20 to 30 degree arm angle and a 3-7% arm slope. A maximum of a one foot drop is recommended for fish passage. Little study has been done on the effects of these ranges on the resulting velocity distribution or the potential effects of vane geometry on vane failure and modes of failure.

A hydraulics flume study is being conducted to model the practiced geometric ranges and measure the resulting velocity distribution. The flume will also be used to test for diminishing effects as the flow depth increases. Site studies will be conducted to assess the levels and modes of cross vane failures in five stream restoration sites in North Carolina. These will be used for the development of a fault-tree analysis. The geometric data for these vanes will then be compared to the failures to look for any relationships. The flume study began in September 2005 and will be carried on through the spring of 2006. The site studies will be conducted concurrently.

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