

Bend Erosion Mitigation Using Alphabet Weirs

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Abstract. The Bureau of Reclamation in Albuquerque, New Mexico has requested that channel maintenance techniques be designed and tested within two representative reaches of the Rio Grande River. These techniques used native rock material for weir construction. After initial tests were performed with bendway weirs installed, a new set of weirs were tested for erosion control measures. Implementation of ‘alphabet’ weirs was requested by the bureau. Alphabet weirs are rock structures placed in the center of the channel and extend up both banks to mitigate erosion. There were two types of weirs tested: cross-vanes (U) or ‘vortex’ weirs and W-weirs. Initially created by Rosgen, these structures were modified to fit into two different types of bends along with the bends’ transition while adhering to Rosgens basic design principles. Each type of weir was tested in every reach, varying the profile slope from a minimum of 4.5% to a maximum of 7%. A complete hydraulic performance assessment of the weirs along with shear stress distribution and eddy formations was requested for analysis and study.

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