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Experimental study on the layouts of piers of slit-check dams

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A check dam is the structure that lays across the stream in the area of the origin of the stream. Check dams can be used to modify the velocity of stream flows, reduce erosion and also trap amounts of channel sediment, and help channel side-slope stabilize. Check dams are grouped into the closed type and the slit type. The slit-check dam is considered to be preferable environmentally because it has less barrier between the upstream and downstream areas of the channel. In this study, four layouts of piers in plan view (i.e. aligned, curved, inverse-curved and interlaced) with different slit widths were tested by an experiment. The slope of the experimental flume is fixed at 15 degrees. The ratios of slit width (d/D), the slit widths d divided by the granular diameter D, are ranged from 0.63 to 2.27. The volumetric concentrations Cv of granular-water mixture are controlled between 0.2 and 0.7. The sediment control efficiencies Es at various Cv for different layouts are presented. The results showed that Es has an increasing tendency with increasing Cv for any layouts of piers at the same slit width. The curved and the inverse-curved layouts have better sediment control efficiency than the aligned and the interlaced ones.