

Competence: Competence is a function of velocity only. It is a measure of the diameter (d) of the particle that a river can move. Competence varies approximately at the square of the stream velocity(v).

So, $d \propto v^2$

Let $v=5$; so $d=25$ mm;

Or $v=6$ then $d=36$ mm.

So increase in 20% of stream velocity causes an increase in 44% of the diameter of aggregate size. This concept of competence can be applied in determining particle size during construction of dam. The purpose of dam is to constraint the flow of water and the discharged materials. Here the size & weight of the constituent particles should be such that they can resist the pressure of water & the thrust of the carried particles. So, with the concept of competence we can determine the maximum size of particles that a particular channel or river can transport with in its highest mean flow velocity. Now we can design the dam with particles or unit element of appropriate size & weight so as to resist the pressure of water & the maximum thrust due to the largest possible particles present at the flow.