

RIVER TRAINING

Problem 1: A river can be trained to obtain a stable bed considering the $782 \text{ m}^3/\text{s}$ discharge. The side slope of the trapezoidal channel bed is $\frac{1}{2}$ and the bed slope after training is 0.0008. $D_{50}=32 \text{ mm}$, $D_{90}=55 \text{ mm}$, specific weight of the material is 2.65 t/m^3 , manning roughness coefficient is 0.024. Determine dimensions of river bed considering critical shear stress.

Problem 2: The 8 m width and 1 km length wild river should be trained with bed fall (bed drop) that bed slope is decreased from 0.018 to 0.001. The maximum flood discharge is $16 \text{ m}^3/\text{s}$ at a water depth of 1.4 m. Find the height of the bed fall and control river training structure that is effective or not effective during the flood.

Problem 3: The 50 m length spurs are going to construct along with a river. Water depth is 4.5 m and the Chezy coefficient is 40 (C). Find the appropriate distance between spurs.

Problem 4: The 800 m length river can be trained with sills, also the bed slope will be decreased from 0.0012 to 0.0007. The 260 m water surface width of the rectangular river bed conveys to $1250 \text{ m}^3/\text{s}$ discharge. The water depth is 3.2 m. Find the height of the sill which normal water depth on the sill is 1.5 times of the critical depth.