GEOLOGY

Notes by-

Pravin S Kolhe,

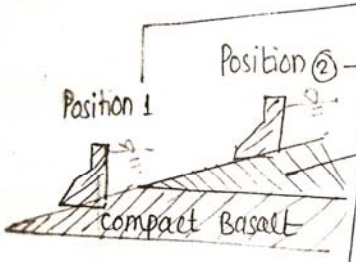
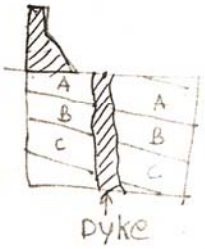
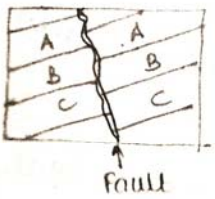
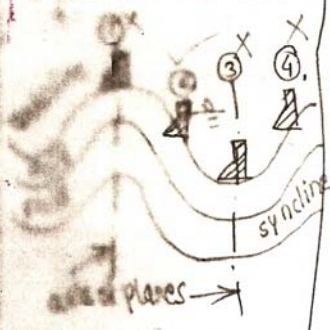
BE(Civil), Gold Medal, MTech (IIT-K)

Assistant Executive Engineer,

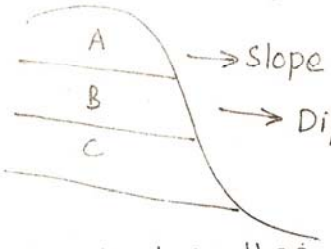
Water Resources Department,

www.pravinkolhe.com

Geological Problems in dam

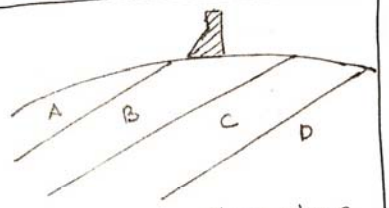
Geological condition	Explanation
① Dam site on Basalt: 	compact basalt is jointed hence percolation through found^{n} is possible. → Top portion of compact basalt is vesicular amygdaloidal and it is unjointed. It is suitable for dam site. Treatment:- ① If jointed rock is fresh it can be improved by consolidation grouting. ② Providing impervious blanket & cut off wall. ③ To reduce uplift, drainage gallery is provided.
② Dyke at dam site:  (No serious Problem)	Dykes in 'MH' are narrow & joints become watertight at depth. Majority of dykes has not show any problem. Treatment:- ① Remove jointed portion of dyke. ② Lower portion is grouted & back filled with impervious matl.
③ Fault at dam site. 	* If fault zone matl. is fresh consolidat^{n} grouting may be done. * Fault zone matl. is decomposed, then it is to be removed & back filled with concrete.
④ Dam site at Fold:- 	Position ① : On axis of antidine :- It is jointed portion, unstable ⇒ Unsuitable. Position ② : Limb :- Stable ⇒ suitable Position ③ : Axis of syncline It is jointed portion, unstable ⇒ Unsuitable Portion ④ Though stable zone beds dipping on d/s side, hence percolation of water through found^{n} is possible;

⑤ Dam site with respect to dip & strike

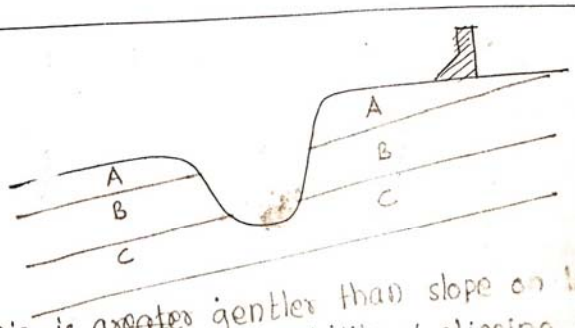


* Slope is steeper than dip & both are in same direction.

When dam is aligned along dip (i.e. across strike direct^{n}) on one flank bed will be dipping in slope direct^{n} & hence possibility of slipping along bedding plane. Hence avoid dam alignment aligning along dip.



Dip is steeper than slope hence no possibility of slipping along bedding plane.



Dip is ~~greater~~ gentler than slope on locally d/s side, there is possibility of slipping along bedding plane bet^{n} A & B.