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Subject:-

HYDRAULIC STRUCTURE

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(1)

## Discharge Relation:-

Therefore, the stage discharge curve used for routing purpose in plot for the maximum elevation obtained during the passage of flood hydrographs of varying magnitudes. The result is the plot being in single line. A deflected treatment of unsteady flow in included is standard textbook. Such as (How (1959), & is beyond this scope.

One of the basic equation used throughout which constitutes the basis of many hydraulic calculation, is the energy balance some time referred to the Bernoulli equation.

At two location along a stream the energy of the water at the upstream location water the down stream location plus energy loss that occur b/w the two location.

The hydraulic grade line is a hydraulic profile of the piezometric level of water all points along the line.

The theorem usually applied to water moving into conduit open channel, stream etc.

(2)

The energy grade line is a line drawn above the hydraulic grade line a distance equivalent to the velocity head to the flowing water at each section along a stream channel, or conduct.

In planning & evaluating aspect of water stored protection if necessary for w. Departments of Agriculture, Human Resources, Conservation Service hydrologist & engineers to develop.

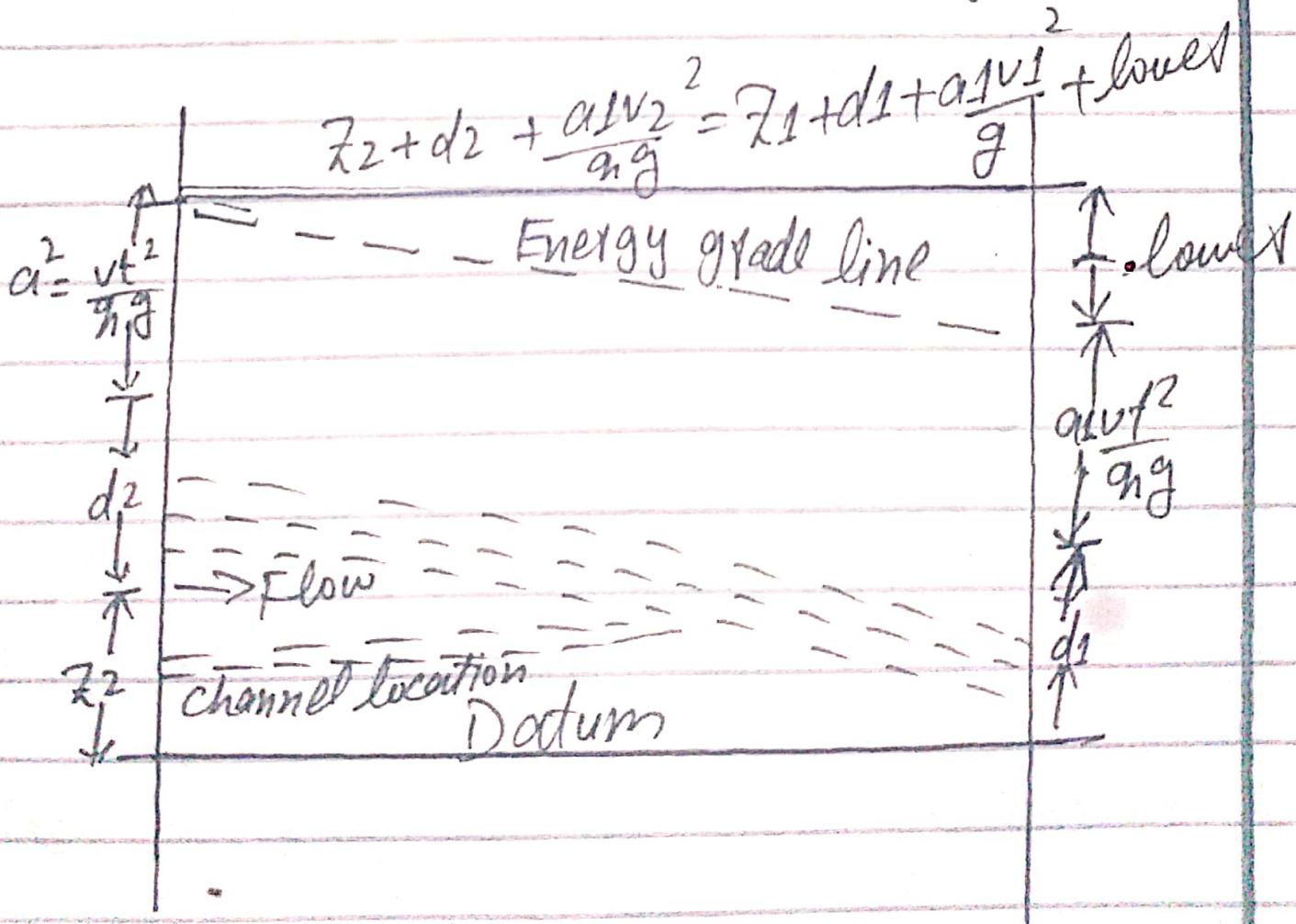
Stage discharge curves at selected location on natural streams.

Many hydraulic textbooks, handbooks, (NRCS) National Engineering Handbook (NEH), Section 3 Hydraulics 1956, and other contain method for developing stage discharge curves assuming nonuniform steady. Even some of these methods are elaborate & time consuming. The types of available field data and the use to be made of these stage discharge curve should dictate the method used in developing the curve.

(3)

The doctor of change of discharge for a given portion. The stage discharge curve can differ b/w the rising & falling side of a hydrograph.

After passage of the floods crest the water reenters the stream end again curve a highly variable discharge together with a stream slope less than for constant discharge.



(4)

## ① Direct measurement :-

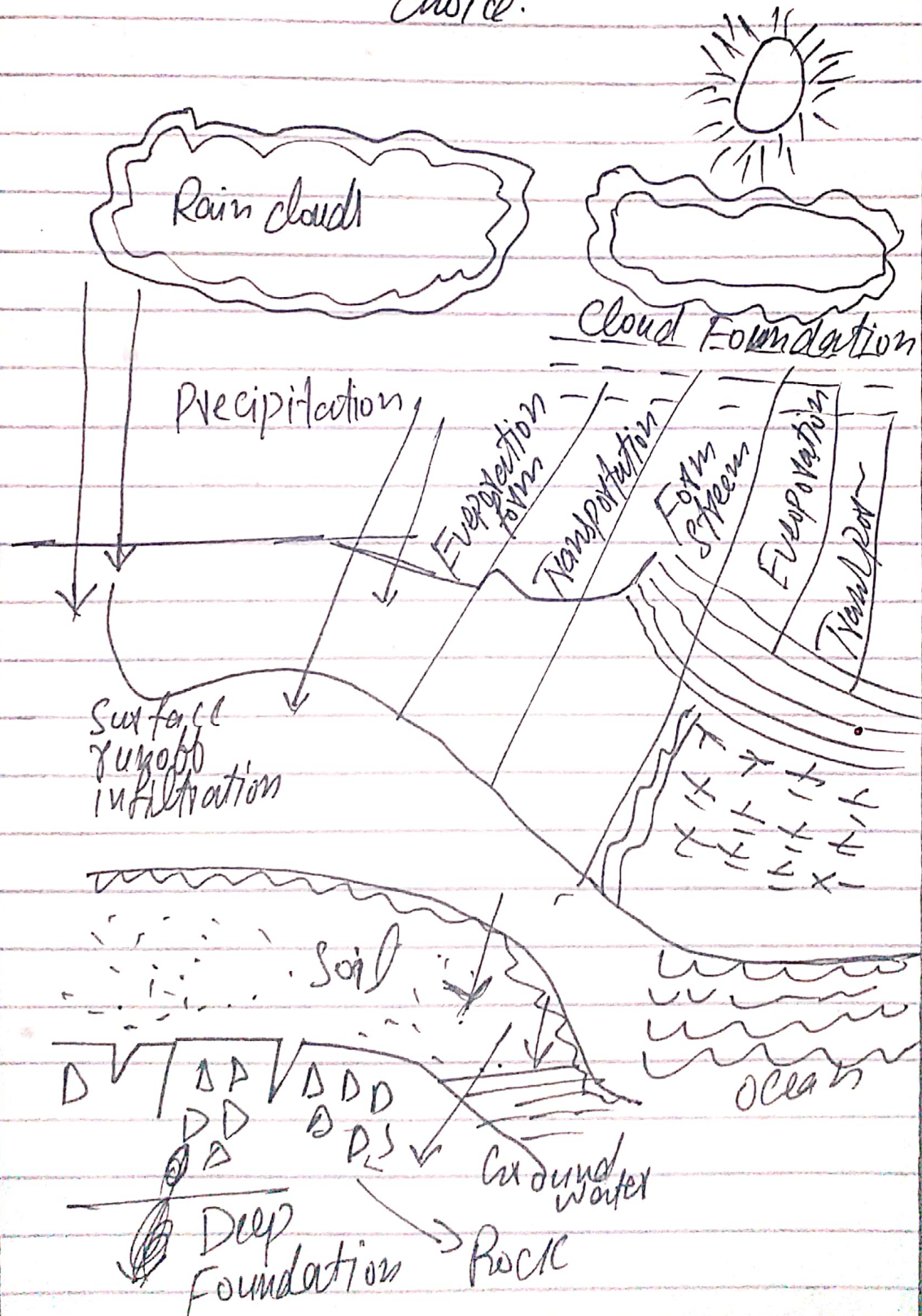
The most direct method curves of natural streams to obtain velocities selected point through a curve section. The most popular method is to use a current meter, other methods include the use of dynamometer, pitot tubes and chemical and electrical method. The velocity head tool may be used to measure flow in square streams or backflow in larger stream.

## ② Indirect measurement :-

Indirectly discharge is measured by method such as e.g. stop-area, constructed opening flow of a dam, flow through a culvert, and critical depth. The method describe in technique of water resource investigation of the U.S Geological survey.

(5)

Establish the stage discharge relationship for a concrete rectangular box culvert used suitable data of our own choice.



(i)

## Q2 - loads of bridge foundation.

Foundation types depend primarily on the depth and safe bearing pressure of the bearing stratum, also restriction placed on differential settlement due to the types of bridge deck. Generally in case of simply supported bridge deck differential settlement of about 20 to 25 mm can be tolerated, whereas multi-span continuous decks 10 mm is usually considered as maximum.

Bridge foundation into two categories.

↓ Strip Footings: One of each pier & abutment - However, it is sometime convenient to split the deck into two halves longitudinally along the centre line, this is then continued to the footings.

(ii) Piled foundation: It is possible to have a combination

of both  
(see) Pier being piled with abutment on strip footing.

## Working Mechanism.

A bridge is a structure built to span a physical obstacle, such as a body of water, valley, or road, with closing the way underneath - it is constructed for the purpose of providing passage over the obstacle, usually something that can be detrimental to cross otherwise. There are many different designs that each serve a particular purpose and apply to different situations. Design of bridge vary depending on the function of the bridge the nature of the terrain where the bridge is constructed and anchored, the material used to make it, and the funds available to build it.

Mostly likely the earliest bridge were fallen tree and stepping stone while most neolithic people built boardwalk bridge across marshland - the Arkadiko Bridge dating from the 13 century BC.