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Section = "A"

QNO1:

Differentiate B/w Culvert and Causeway.?

Definition:

→ Causeway is a road That is raised, as to be above watar, Murshland etc.

→ While The Culvert is a transverse channel under a road or railway for the draining of water.

Culvert	Causeway.
→ Culverts are totally enclosed structure That can be semicircular, rectangular, elliptical or pear-shaped.	→ Causeway is not proper moveble.
→ No deep foundation is requried for a Culvert.	→ Causeway can be constructed of earth, masonry, concrete or wood.
→ The length of culvert is typically not more Than 6 meter.	

Culverts	Causeway :
→ Culvert are built at less Than 20 feet high over The obstruction-	If a Causeway has not vent to flow the water Than it is called low level Causeway.
→ Culvert are usally embedded in The Soil which bear The major Portion of The Culvert load-	A high level Casuwey is submesirable road bridge designed to be over toped in floods.
→ A Culvert is generally a tunnel- Like structure that allow water to pass under a roadway or railway	

QNO I
Part 2. (B)

Define Cross drainage work.

In an Irrigation project, when The network of main canals, branch canals, distributaries etc. are provide Then These canals.

Why it is necessary.

* The water-shed canals do not cross natural drainage, But in actual orientation of canals network This Ideal condition may not be avilable & the abstacle like natural drainage may be present across the canal.
So the cross-drainage work must be provided for running the Irriagation system.

* At the crossing point The water.

* It is required to dispose of The drainage water so That the canal supply water remains uninterrupted.

Types:

(i) Inlet & outlet:

When possible drain water as taken as The Canal to be discharged afterward into a drain at suitable location.

(ii) level Crossing:

This Structure make at possible to dispose off drain water safely at same level as That of a Canal.

(iii) Adequte:

It Carries Irriagation Canal are over drain.

(iv) Super passage:

It Carries a drain over an Irrigation cannals.

QNO2:-

Parts. A.

Differenticate b/w Weir & Barrage.

Weir:-

Weir is a Solid obstruction put across The river to raise water level & divert The water into Canal.

- If water is Store for a Small period of Short Supplies It is Called Storage weir.

- The main difference between a Storage weir & a dam I only in hieght & duration for which The Suppy is stored.

Barrage:-

The Function of barrage is Similar to That of weir but The heading up to water is effected by the gate alone.

- During The Floods The gate are raised to Clear off The high Flood level - enabling the high Flood to pass downstream with minimum.

- No Solid obstruction is put across The river - The Crest level in The barrage is Kept at low level.

- Due to less silting and better Control over The Level.

- How ever barrage are more Costlier Then weir.

* Difference b/w weirs & Barrage.

* A weir is a Impermeable barries That is built across a river to rise The water Level at upstream side - on other hand, a barrage Involve adjustable gate installed over a dam to maintain the water surface at different Levels and at different time.

* Both weirs & barrage are obstrackes to the water Course, Both The Barrage with The expensive Structure, while the weir is relatively Cheap structure -

* In ~~weir~~ weries after long Time silting problem occure, while the barrage is no silting occure -

* Barrage are built near cities so that the amount of water flowing in the river can be controlled by opening and closing the gate to save the city from flooding.

* **Sloping weir.**

This types is suitable for soft sandy foundation. It is used where difference in weir crest & downstream riverbed is not more 3m. Over the sloping glacis, weir of this types is of recent origin.

* **Vertical Drop weir:**

A vertical drop weir consist of a masonry wall with a vertical downstream face & a horizontal concrete floor.

①

Q NO2:

Part B

Reynod's Number:

The ~~ration~~ ratio of inertia force to viscous force is said to be the reynold no.

Laminar:

The flow in a pipe is laminar if the ~~ro~~ reynold number is less than 2100.

Turbulant: if the reynold number the greater than 400 than it is turbulent.

Neither laminar nor Turbulent Flow-

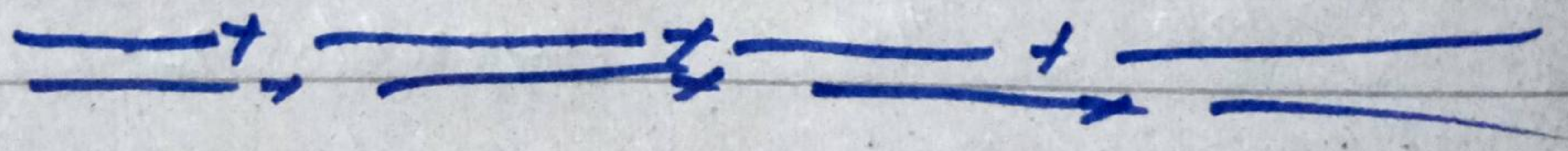
When the reynold number is between 200 and 2800, the flow is neither laminar nor turbulant.

lower Critical velocity: The velocity at which flow change form laminar to transition is know as Lower Critical velocity-

(2)

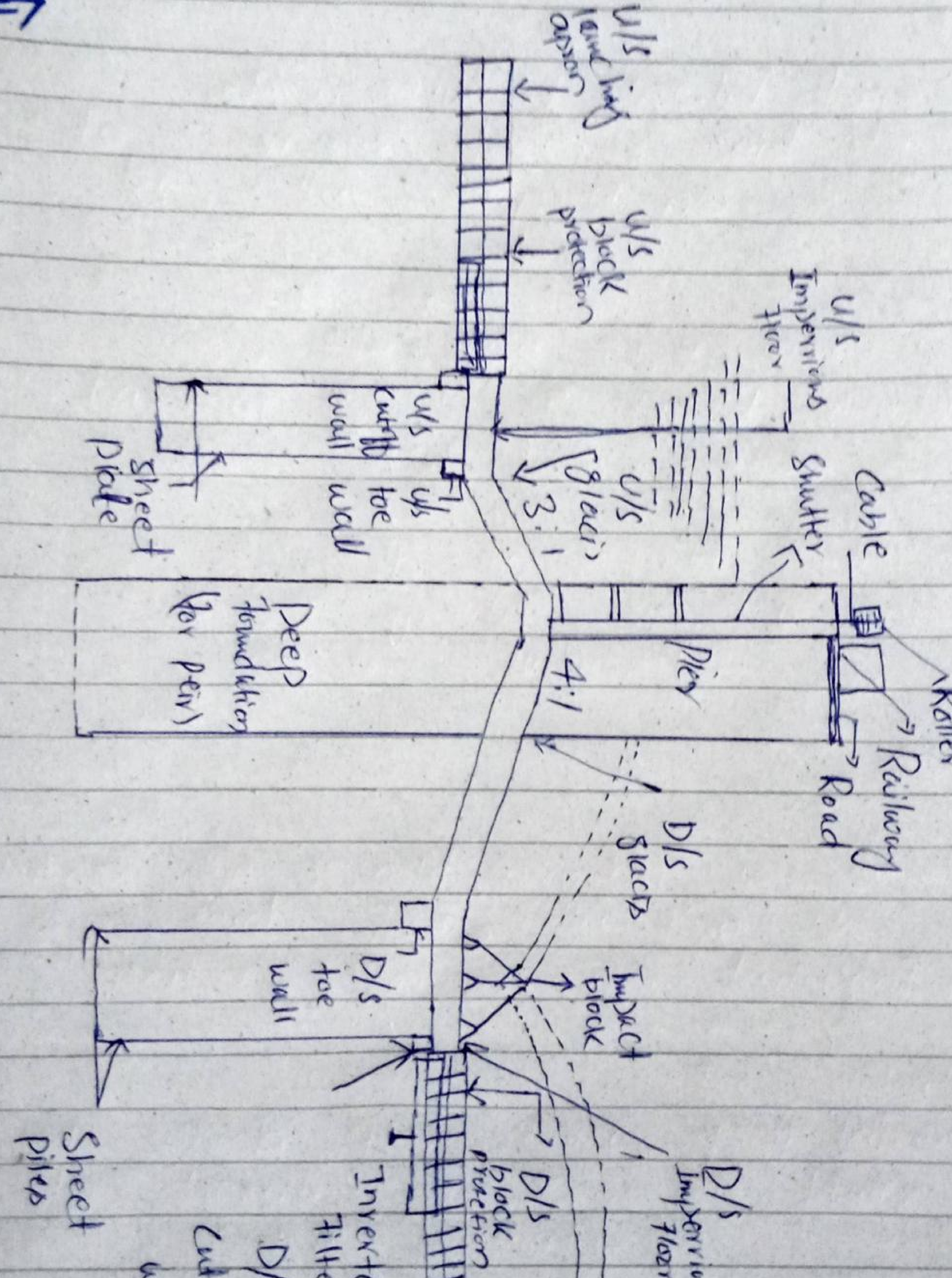
Higher Critical velocity.

The velocity at which Flow Change Form transition to turbulent as Called Higher Critical velocity.



QNO3

Part A



Component part of Barrage.

QNO3
parts B

$$D_N = R_s (W/L)^{0.61} \quad \text{——— (1)}$$

Where R_s is the regime source depth.

The maximum soure depth in a single - span bridge (no piers) with a straight approach (case 1) about 25% more Than The normal soure given by equation (1), where the case of multispen structure with a curved approach reach (case 2), it is 100% more Than The normal scour.

If the construction is predominat, The maximum soure depth is the maximum of case 1 or case 2, or the value given by

$$D_{max} = R_s (W/L)^{1.56}$$

QNO4

Problem.

Givendata:

L.L = 1.5 Kip/ft²

D.L = 300 lb/ft²

$\theta = 30°$

unit weight of soil = 100 lb/ft²

Diamension = 15' x 15'

f_y = 60 ksi steel

Concrete = 1:2:4 = M15

D = 0.92m Thickness.

Solution:

(i) load

Total load on Top = Self weight + L.L + D.L

Self weight = 3x15 = 45 kN/m²

45 kN/m² = 0.939 kip/ft²

W = 1.5 + 0.939 + 0.3

ω = 2.739 kip/ft²

② Co-efficient of Earth Pressure.

$$Ka = \frac{1 - \sin\alpha}{1 + \sin\alpha}$$

$$= \frac{1 - \sin(30)}{1 + \sin(30)}$$

$$\boxed{Ka = 0.33}$$

(3) Letral pressure due to (Dead load + L·Load)

= Total vertical load × Ka

= (L.L + D.L) Ka

= (1.5 + 0.3) + 0.33

= $\boxed{0.594 \text{ Kip/ft}^2}$

or

$\boxed{28.4 \text{ KN/m}^2}$

(4) Latral pressure due to soil.

~~= Ka o x S~~

$K_a \times \gamma_{soil} \times h$

$= 0.33 \times 0.1 \times 18$

$= 0.594\ kip/ft^2$

or

$28.4\ kN/m^2$

(5) Latral pressure at Top.

$L.L + D.L = 0.594\ kip/ft^2$

$= 28.4\ kN/m^2$

(6) Latral pressure due to bottom.

latral pressure due to (L.L + D.L) + latral pressure due to soil

$= 0.594 + 0.594$

$= 1.188\ kip/ft^2$ or

$56.88\ kN/m^2$