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Section # "C"

Department # BE (civil)

Q No. 1
(a)

	Culvert	Causeway
(i)	culvert is a of tunnel shape carring a stream of water under a road or railway	A causeway is of road it is built a embankment
	it work as a bridge to pass on it	it is Supported mostly on by earth or stone
	it is normally uses for natural flow of water for controlling it.	and it is not a bridge because it Support a roadway between piers

— X — X — X —

Q No. 1: part (b)

Cross Drainage Work: is a structure carrying the discharge from a natural stream across a canal intercepting the stream.

Necessary:

it is required to dispose of the drainage of water so that the canal supply water remain uninteruppteed.

Types:

Some of types are:

(i) adequate:: it carries an irrigation canal over a drain.

(ii) Super passage: it carries a drain over an Irrigation canal.

(iii) Level crossings: This structure make a possible to dispose of drain water Sopply at Same level as that of a canal.

(iv) Inlet and outlet: When possible drain water is taken w the canal to be discharge afterwards to be drain at Suitable location.

Q No. 2

ANS (a)

Weir:

Weir are commonly used to control the flow rates of river during periods of high discharge

Sluice gates are used to increase or decrease the volume of water going out.

Barrage:

It is used to convert tidal energy into electricity by forcing water through turbine by activating a generator

Q No. 2 part (b)

ANS

Rynold number:

the product of density times length divided by viscosity coefficient.

this is proportional to the ratio of inertial forces and viscous forces in a fluid flow.

Laminar.

the flow in a pipe is laminar if the rynold number is less then 2000

Turbulant

if the rynold number is greater then 4000 then it is a turbulant

Neither laminar nor turbulant flow

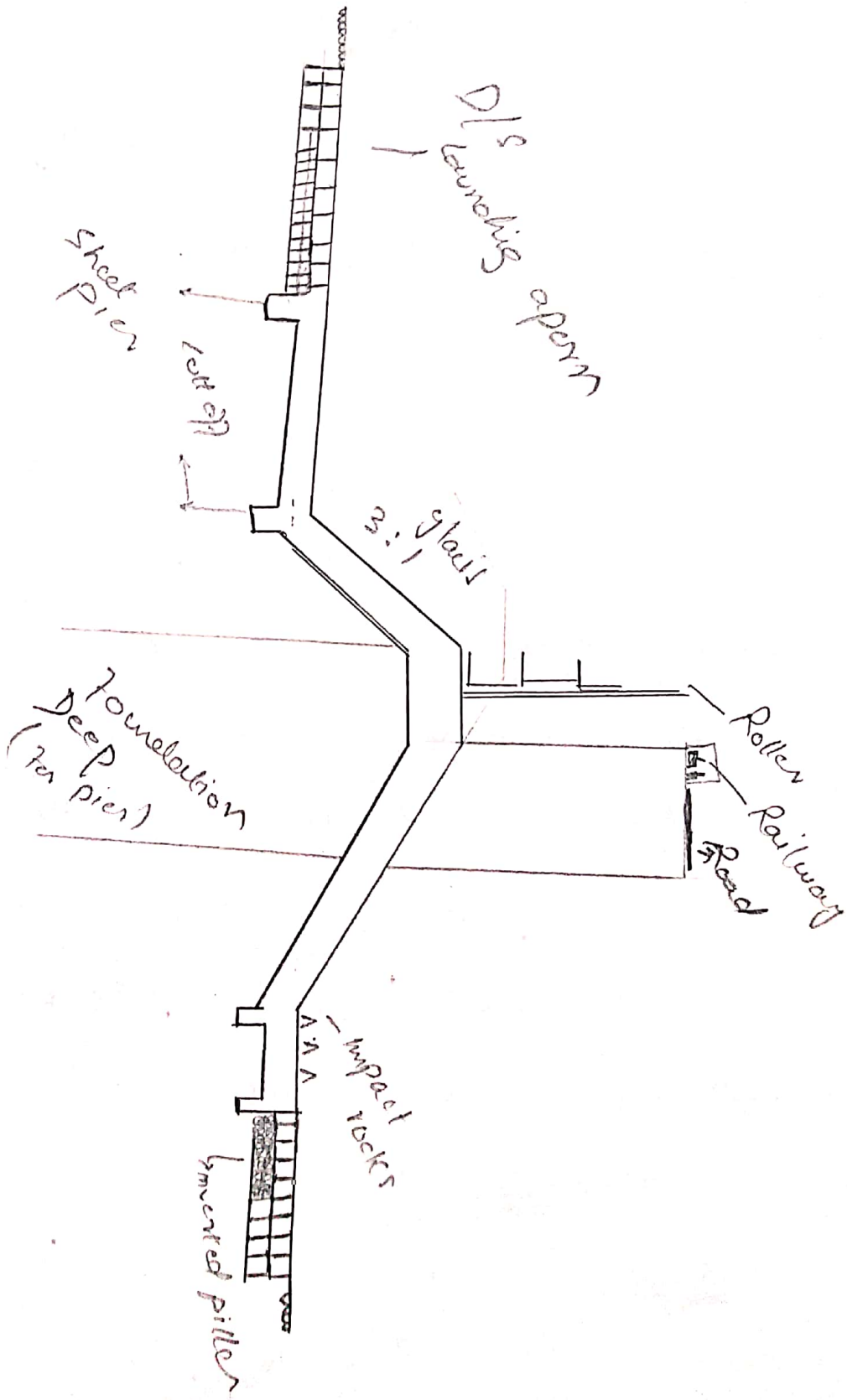
when the rynold number is between 2000 and 2800 the flow is neither laminar nor turbulant

Lower Critical velocity

the velocity at which flow changes from transition to turbulant as called higher critical velocity.

Q No. 3

(a) Neat sketch of barrage



Q No. 3 part (b)

Ans

If the contracted width is then regime width then the normal Scour depth D_N under the bridge is given by.

$$D_N = R_s \left(W/L\right)^{0.61}$$

Where R_s is the regime Scour depth. the maximum Scour depth in a Single-Span bridge with no piers is a straight approached (Case 1) where in the case multispan structure with a curved approach reach Case (2). it is 100% more than normal Scour.

Q No. 4

Given data:

$$L.L = 1.5 \text{ kip/ft}^2$$

$$D.L = 300 \text{ lb/ft}^2 = 0.3 \text{ kip/ft}^2$$

$$\phi = 30^\circ$$

thickness; $0.92\text{m} = 3.0176 \text{ ft}$

(i) load calculation;

total load coming on top slab = Self wt of slab + L.L + D.L → (A)

Self wt of slab = 3.0176×5.6202

$= 16.96 \text{ kips}$

total load "w" = $16.96 + 1.5 + 0.3$

$= \boxed{18.59 \text{ kips/ft}}$

(2) Co-efficient of earth pressure.

$$Ka = \frac{1-\sin\phi}{1+\sin\phi} = \frac{1-\sin 30^\circ}{1+\sin 30^\circ} = 0.33$$

(3) lateral pressure due to (D.L + L.L)

$$= (LL + DL)\,Ka$$

$$= (1.5 + 0.3)(0.33)$$

$$= 0.594 \text{ kips/ft}^2$$

(4) lateral pressure due to Soil

$$= Ka\,(\gamma h)$$

$$= 0.33\,(0.100 \times 18.176)$$

$$= 0.594 \text{ kips/ft}^2$$

(5) lateral pressure at top;

= lateral pressure due to (D.L+L.L)

= 0.594 kips/ft^2

at bottom

lateral pre due to (D.L+L.L)

+ lateral pre due to Soil

= 0.594 + 0.594 = 1.188 kips/ft^2

$$= 1.188 \text{ kips/ft}^2$$