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NAME- MUHAMMAD MAMOON

ID = 7690

Sec = C

PAPER= Hydrulic Structure.

DATE= 24 / June / 2020

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Question = 1 :-

PART-(A)

ANSWER :

★ CULVERT	★ CAUSE-WAY
1 Culvert is of a tunnel shape carying a stream of water under a road or railway.	A cause way is of course a raised road it is built on an ambankment.
2 It works as a bridge to pass on it	It is support mostly by earth or stone.
3. It is normally uses from natural flow of water for controling it	And it is not a bridge because it support a roadway between piers.

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QUESTION: 1:
PART (B).

ANSWER:

★ CROSS DRAINAGE WORK:

Is a structure carrying the discharge from a natural stream across a channel intercepting the stream.

★ NECESSARY:

It is required to dispose of the drainage water so that the channel supply water remains uninterrapted.

★ TYPES:

Some types of cross drainage are following

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1. **ADEQUATE:**

It carries an irrigation channels over a drain.

2 **SUPPER PASSAGE:**

It carries a drain over Irrigation channels.

3. **LEVEL CROSSING:**

This structure makes it possible to dispose of drain water safely at same level as that of a channel.

4. **INLET AND OUTLET:**

When possible drain coater is taken in the cannal to be discharge after-wards into a drain at suitible location.

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QUESTION = 2:

PART (A)

ANSWER:

*Weir:

Weir are commonly used to control flow rates of rivers 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 turbines by activating a generator.

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QUESTION: 2:

PART: (B)

ANSWER:

* REYNOLDS NUMBER:

The product of density times length divided by viscocity coefficient. This is proportional to the ratio of inertial forces and viscous in a fluid flow.

* LAMINAR:

The flow in a pipe is laminar if the reynolds number less than 2100.

* TURBULANT:

If the reynolds number is greater than 4000 than it is turbulant.

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* NEITHER LAMINAR NOR TURBULANT FLOW:

When the reynolds number is between 2000 and 2800. The flow is neither laminas nor turbulant.

* LOWER CRITICAL VELOCITY:

The velocity at which flow change from laminas to transitions is called lower critical velocity.

* HIGHER CRITICAL VELOCITY:

The velocity at which flow change from transition to turbulant is called higher critical velocity.

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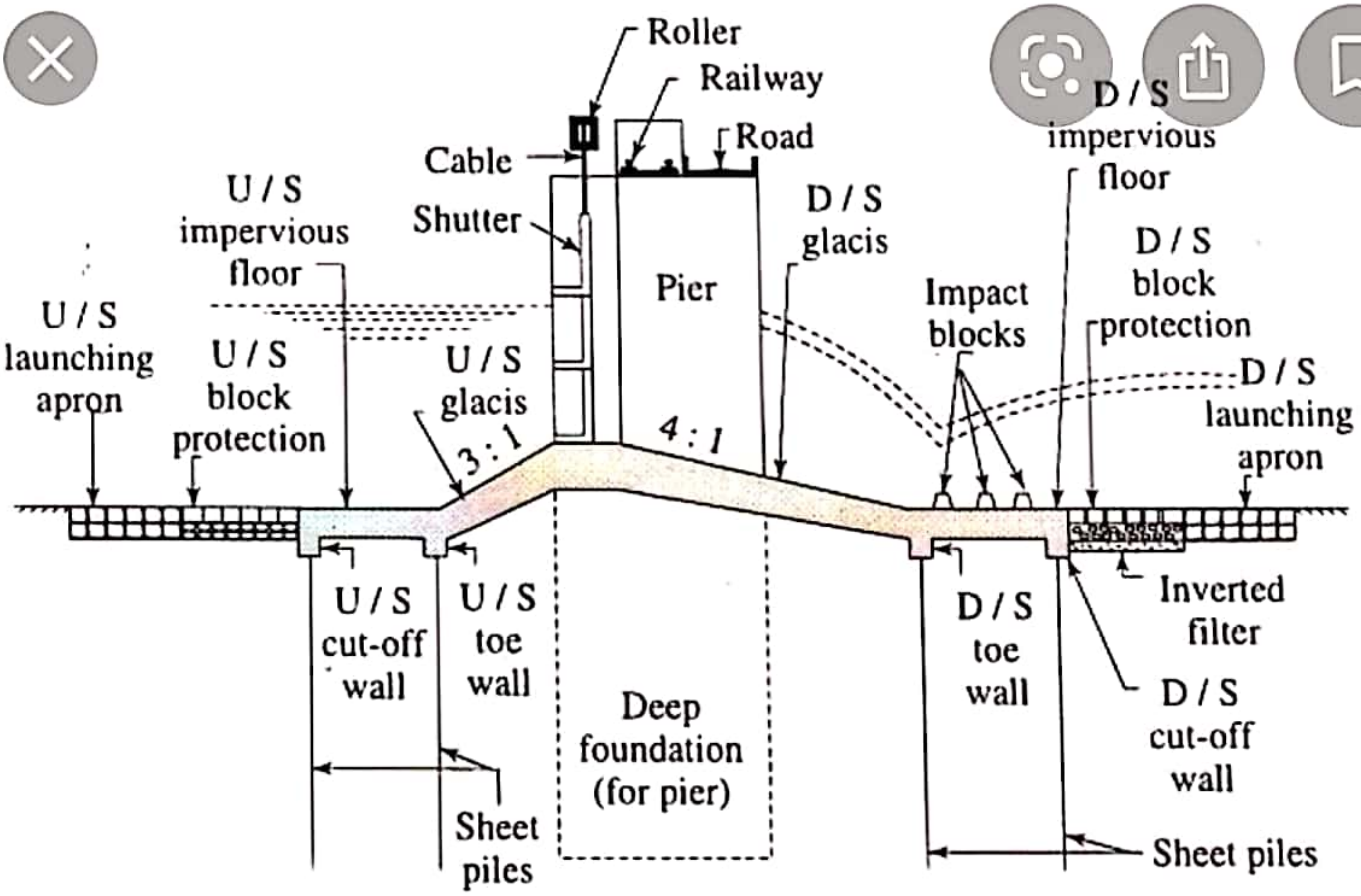

Component parts of barrage

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QUESTION=3
PART-(B)

ANSWER:

SCOUR:

EQUILIBRIUM:

If the contructed width (L) is less than the regime width (W), the normal scour ~~depth~~ depth (D_N) is given by

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

R_s → Regime scour depth

MAXIMUM:

The ~~maximum~~ maximum scour depth in a single-span bridge with a straight approach is about 25% more than normal scour given by equation (10.18)

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In case of multispan structure it as 100% more than normal scaur. The maximum scaur depth is

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

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QUESTION = 4

GIVEN DATA:

Inside dimention = 15 ft × 15 ft

live load = 1.5 K/p^2 = 1500 lb/ft^2

Dead load = 300 lb/ft^2

Unit weight of soil = 100 lb/ft^3

Angle of repase = 30°

Use concrete of 1:2:4 ratio

fy = 60 ksi

Thickness = 0.92 m = 3 ft.

REQUIRED DATA:

Design of box calvert = ?

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SOLUTION:

1. Load Calculation:

Total load carry on top slab =
= self weight of slab + 1.1 · D.1

Self weight of slab = 3 × 150
= 450 lb/ft²

w = 450 + 1500 + 300 = 2250 lb/ft²

2. Co-efficient of Earth pressure:

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

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

$$Ka = 0.33$$

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3 LATERAL PRESSURE Due to (D.L + L.L)

= Total vertical load (1.1 + D.1) x k

= (1500 + 300) x 0.33

= 594 lb/ft²

4 LATERAL PRESSURE Due to Soil:

= ka x γ x h

= 0.33 x 100 x 18

= 594 lb/ft²

5: LATERAL PRESSURE:

(A) TOP:

Lateral pressure due to (D.L + L.L)

= 594 lb/ft²

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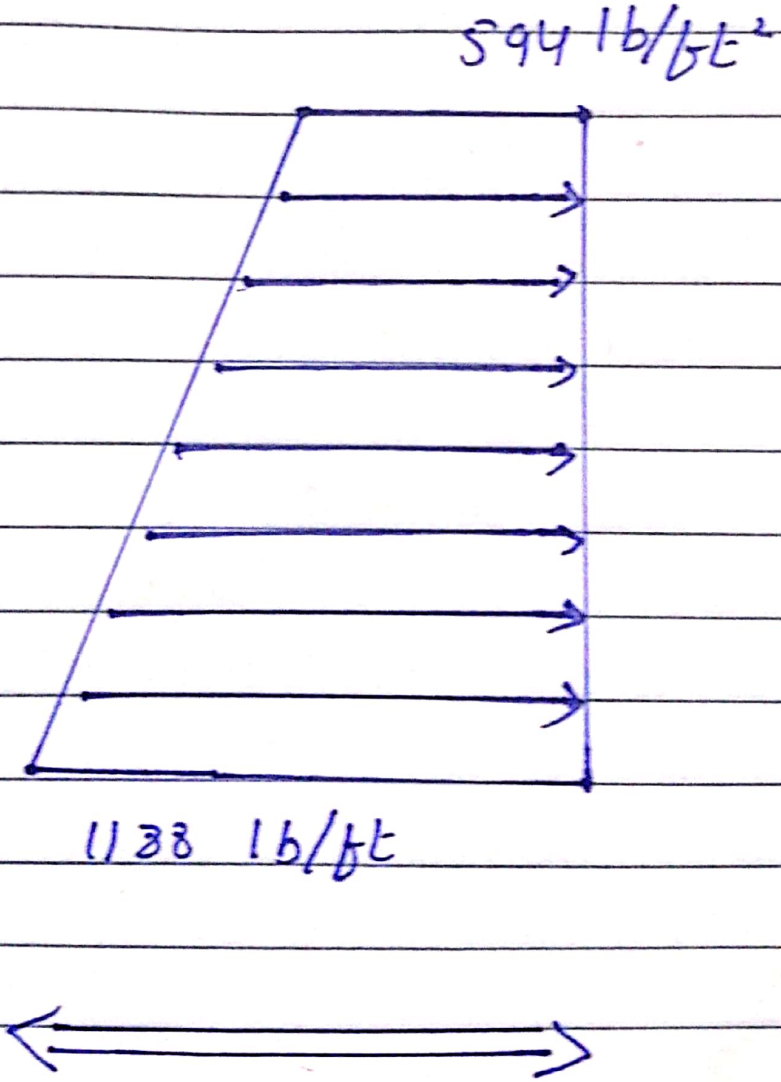
(b) Bottom:

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

= 594 + 594

= 1188 lb/ft²



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