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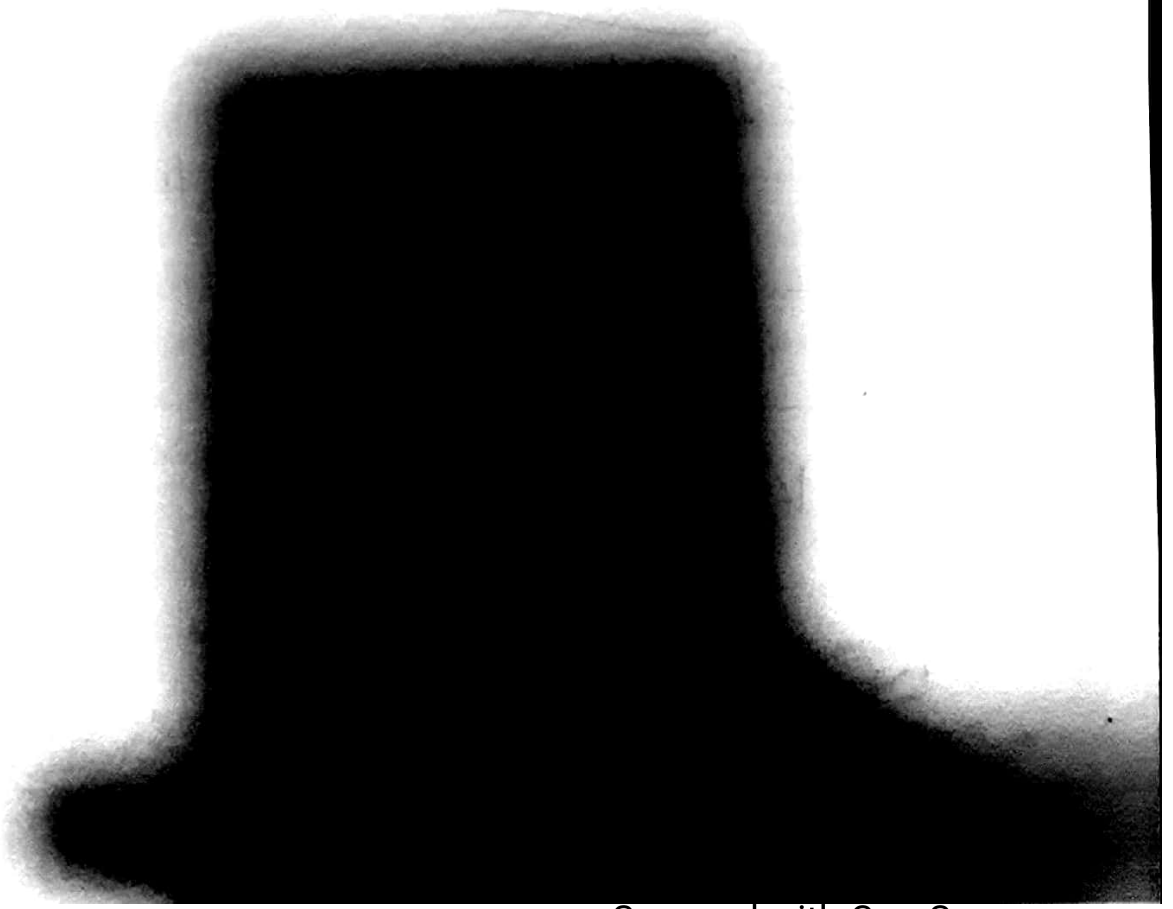
Section — B.

Submitted To — Engr. Adeed.

Subject — Hydraulic Structure.



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Loads On Bridge Foundation due to Scouring:

Maximum amount of load to cause failure in foundation can not be expected due to Indequate Bearing Capacity but by Scouring action & leaching of Mortor joints of well foundation. The Increased moments due to MBG loading would create ~~Especially~~ bending stress in the Steig Especially in the Cap and Setting Junction. In the event of failure of well foundation the well Cap made of Stone masonry would be fail in bending.

Darsi Notes

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Mechanism & Working.

A Significant amount of work has been Conducted on bridge Scour. Such effort Can Classified In two major Categries

① Science.

② Engineering

Engineering Mechanics.

The Engineering Mechanics of bridge foundation is based on its Construction techniques.

The b No of bar are driven to the Well and Connected To well Cap and Pier by dowel bars would the become futile Some have opend treat Even the Event of Failure As well

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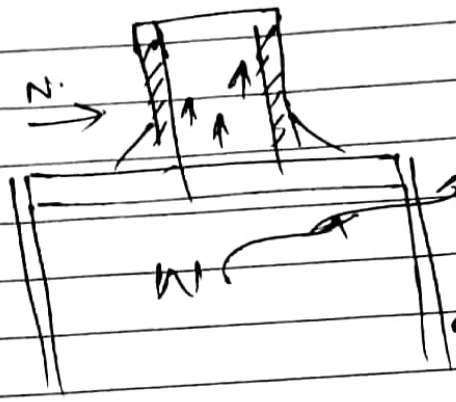
The dowel bars Connect to well Cap upto height of 1.7om above the well Cap would given rise to a lot. friction and Prevent the Pier from Collapsing friction would Generate when there is normal reaction Perpendicular to the Moment of Pier.



To Prevent the Pier from collapsing we showed have $W = F = \mu N$.

W = dead load + live load

F = frictional force

↑ ↑ = Compressive reaction.

Darsi Notes

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Question #1

Establish the Stage discharge relationship for a Concrete rectangular box Culvet Suitable data of your Own choice.

Assumed

$H = 0.45m$, $D = 0.40m$.

$W = 1.2m$ $L = 4om$.

Manning $= 0.0013$, neglect the velocity from $0.3m$.

Calculation

Step # 1.

$$H/D = \frac{0.45}{0.40} = 1.12.$$

As 1.12 is less than 1.2 So.

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Step #02.

$$y_c = 2/3 + 11.$$

$$y_c = 2/c\ (0.45)$$

$$y = 0.1m$$

$$V_c = \sqrt{g y_c}$$

$$V_c = \sqrt{9.8 \times 0.1}$$

$$V_c = 0.31\ m\ Sec$$

$$Se = \frac{V_n^2}{R^{4/3}} = 0.042.$$

Step #03

$$Q = 0.292\ y_o \left| \frac{1.2 y_o}{1.2 + 2 y_o} \right|^{4/3}$$

$$y_c = (q^2/g)^{1/3}$$

$$q = \Phi / w.$$

By Putting Value we get

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y_0 =

0.15 , 0.3 , 0.45

Ø

0.11 , 0.3 , 0.53

y_c :

0.09 , 0.185 , 0.27.

Step # 4.

$$H = y_0 + \frac{V^2}{2g} + k_c V^2/2g.$$

Entrance Co-efficient one.

For Square = 0.5.

Flat = 0.25

Rounded = 0.05

Use 05 for Rectangular

$$H = y_0 + V^2/g + k_e V^2/2g$$

y_0 = 0.15 , 0.3 , 0.45

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H = 0.17, 0.3 , 0.53

for Orifice H/D = 1.2 , Cd = 0.62

$Q = Cd[1.2 \times 0.6)\ (2g(H - d/2)^{1/5}$

$QD = 1.29\ m^3/s$