

Wollo University
Kombolcha Institute of Technology
Department of Hydraulic & Water Resources Engineering

Hydraulic Structure-II (HWRE-3132) Assignment #2..... (15%)

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1) Discuss the following terms in detail:

- a) Diversion head works and their functions (1)
- b) Types of diversion head works (1)
- c) Classification of weirs (1)

2) Discuss in detail about the criteria for selection of a weir site for irrigation (1)

3) Write short notes on the following terms: (3)

- a) Factors governing the design of weirs
- b) Main causes of failure of weirs founded on pervious foundation
- c) Bligh's creep theory of seepage flow
- d) Khosla's theory and concept of flow nets
- e) Piping on foundation of weir
- f) Exit gradient and its importance

4) Give a brief explanation on the function of silt control devices. List and explain the classification of silt control devices. (1)

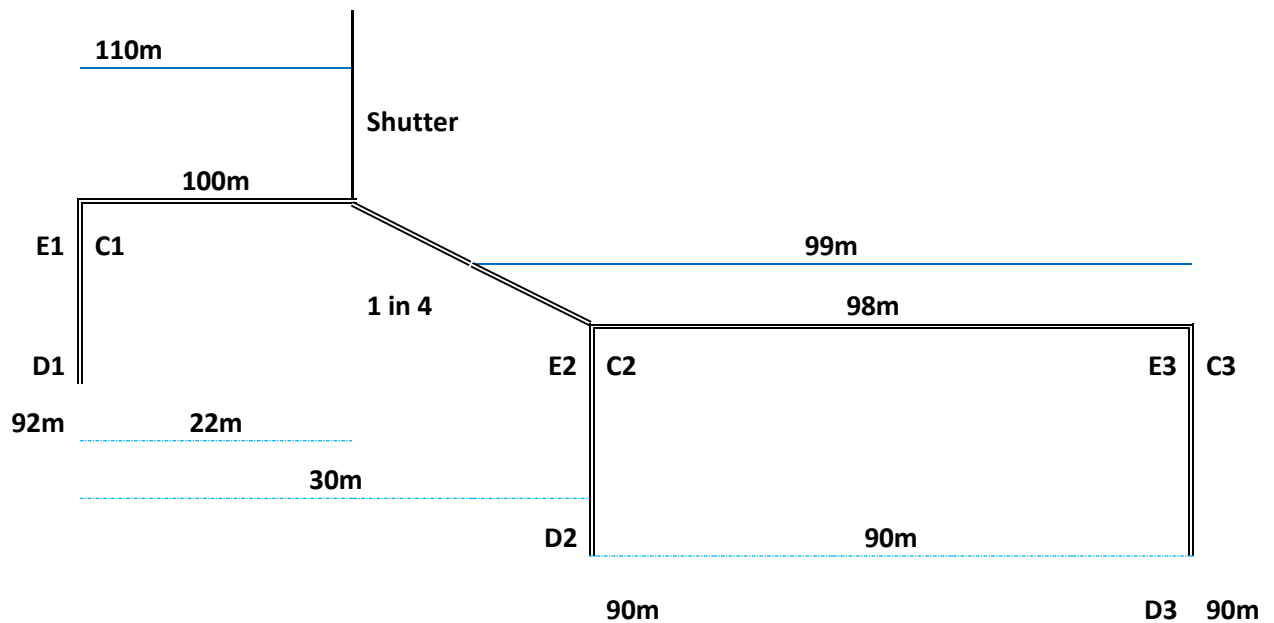
5) Use khosla's curves to calculate the percentage uplift pressures at the three cut-offs for a barrage foundation profiles, shown below applying corrections as applicable. (7)

Given:

- ✓ Barrage without any raised crest
- ✓ Pond level from river bed = $H=10\text{m}$
- ✓ Pond bed material, *gravel, sand*
- ✓ Consider d/s water level=1m

Required:

- ✓ Calculate HGL
- ✓ Find the thickness of the floor
- ✓ Give scaled drawing



➤ Having determined the percentage uplift pressures, explain how the foundation floor thicknesses are determined corresponding to a known specific gravity of the material of the floor.

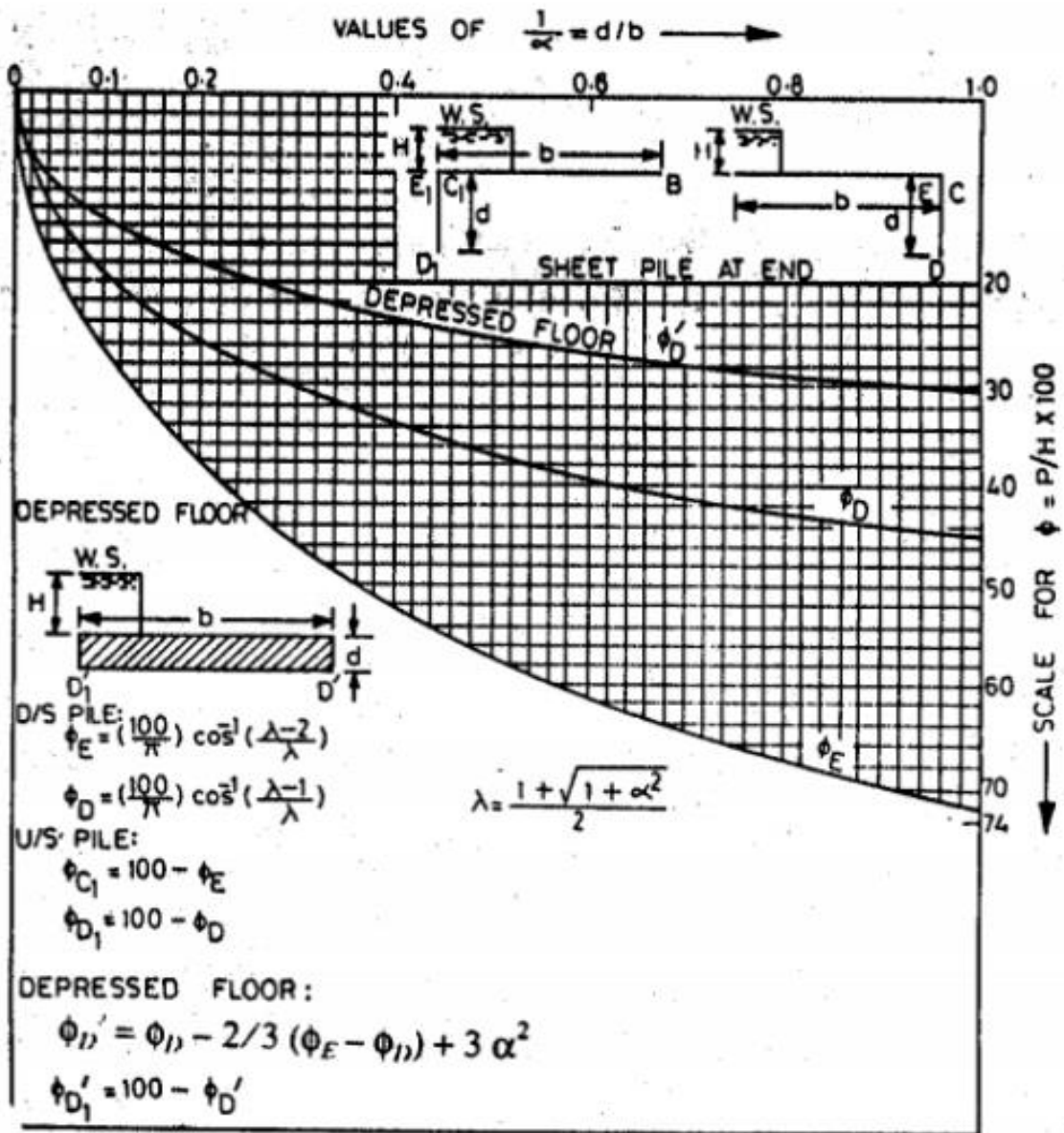


Figure (a): Khosla's Pressure Distribution curve Sheet pile (@ the end and depressed floor)

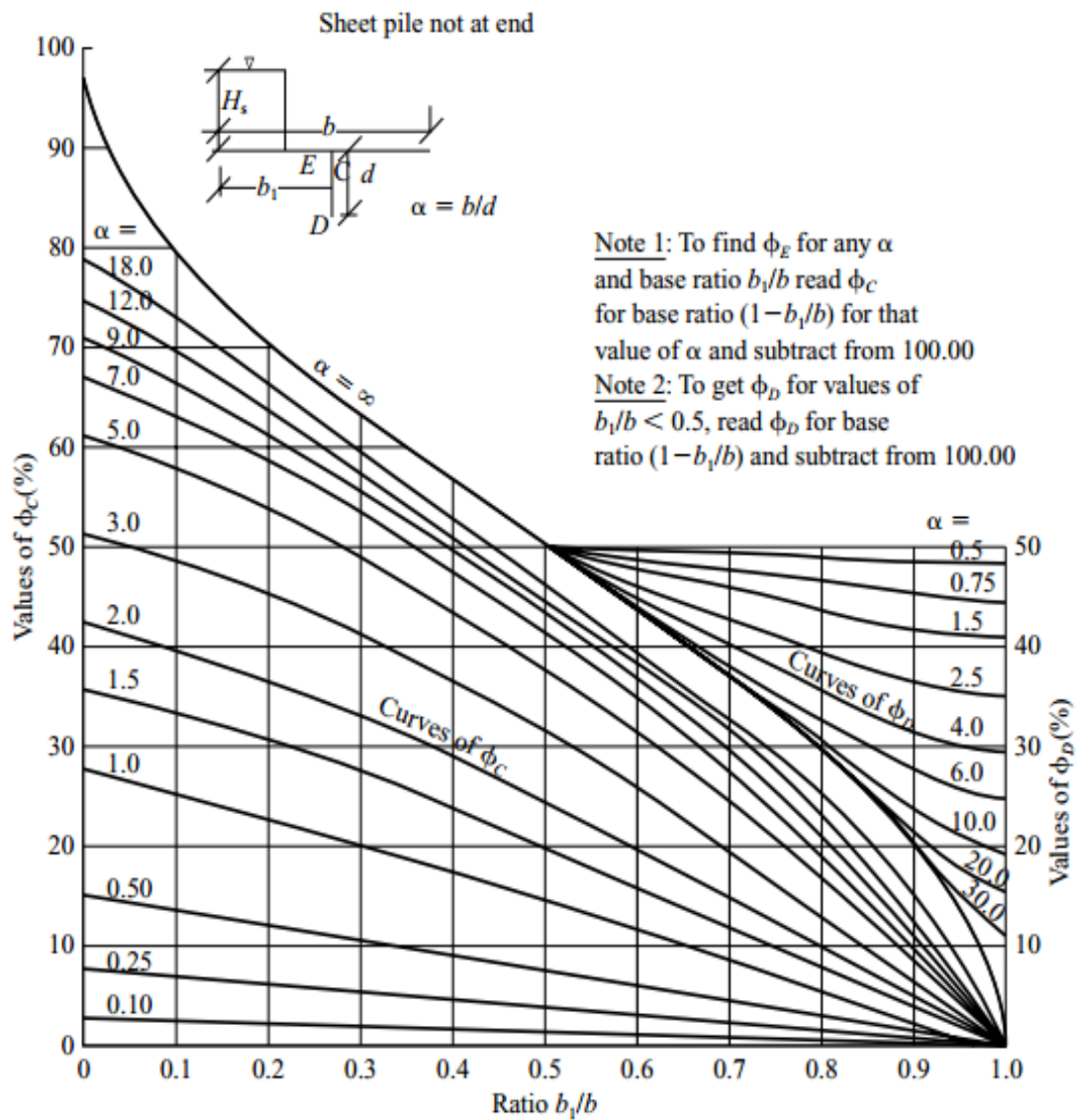


Figure (b): Khosla's Pressure Distribution curve (Intermediate sheet pile)

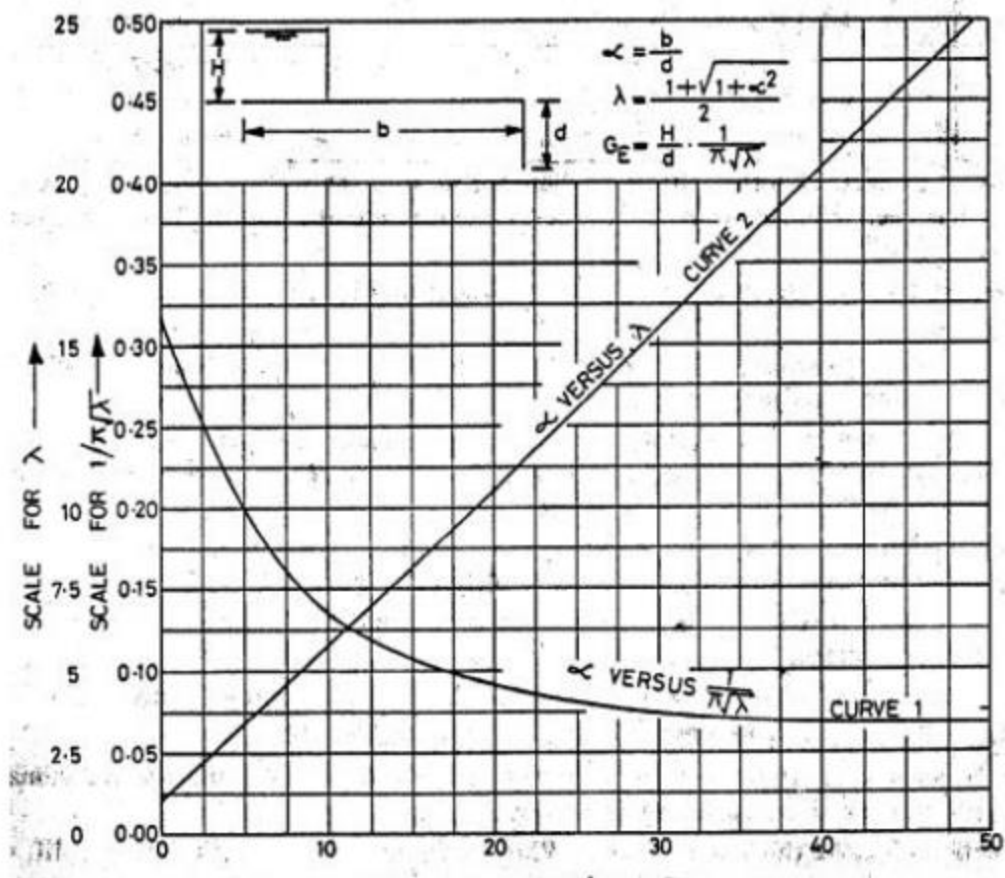


Figure (c): Exit Gradient