تمرین درس هیدرولیک

مسأله ۲-۱۱ از کتاب Chow را که تصویر آن در ادامه آمده حل کنید و ضمن رسم جواب بدست آمده، دلیل تفاوت آن با مقادیر اندازه گیری شده در شکل ۲-۱۰ را شرح دهید.

2-11. A high-head overflow spillway (Fig. 2-10) has a 60-ft-radius flip bucket at downstream end. The bucket is not submerged, but acts to change the direction the flow from the slope of the spillway face to the horizontal and to discharge the low into the air between vertical training walls 80 ft apart. At a discharge of 56,100 ft, the water surface at the vertical section OB is at El. 8.52. Verify the curve that represents the computed hydraulic pressure acting on the training wall at section OB. The computation is based on Eq. (2-9) and on the following assumptions: (1) the relocity is uniformly distributed across the section; (2) the value used for r, for pressure values near the wall base, is equal to the radius of the bucket but, for other pressure values, is equal to the radius of the concentric flow lines; and (3) the flow is entrained with air, and the density of the air-water mixture can be estimated by the

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BASIC PRINCIPLES

Douma formula,1 that is,

$$u = 10 \sqrt{\frac{0.2V^2}{gR} - 1} \tag{2-15}$$

where u is the percentage of entrained air by volume, V is the velocity of flow, and R is the hydraulic radius.

2-12. Compute the wall pressure on the section OA (Fig. 2-10) of the spillway described in Prob. 2-11. It is assumed that the depth of flow section is the same as that at section OB.

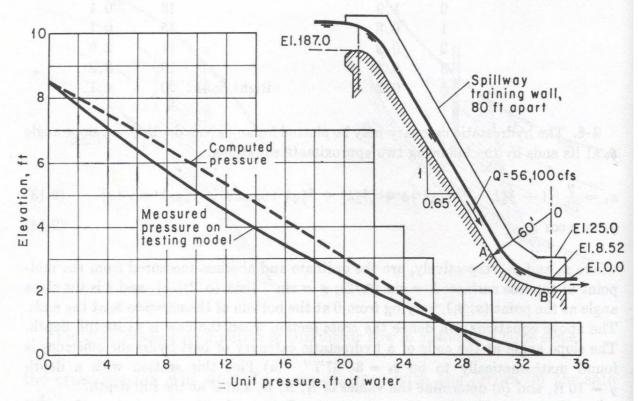


Fig. 2-10. Side-wall pressures on the flip bucket of a spillway.