DIVERSION WEIRS

7.1. An irrigation area has a maximum elevation with 630m. The irrigation channel has a bed slope and length; 0.0005 and 12 km, respectively. Total local head losses of the channel are calculated as 0.4m. **Determine what has raised the water level in front of the diversion weir.**

7.3. A diversion weir is constructed on a river of 852 m bed elevation. The gross length of the structure is 74 m without considering the width of the settling basin and raised water elevation is at 860 m. The gap between the bridge piers on the diversion weir is 6 m and the width of the piers is 0.80 m. **Find the effective length of the diversion weir.**

Maximum and minimum design discharges are 460 m³/s and 35 m³/s, respectively. **Determine crest elevation and height of diversion weir. Find raised water elevation for the diversion weir (if intake discharge is 14 m³/s).**

h / h_{max}	0.3	0.4	0.5	0.6	0.7	0.8	1.0	2.0
c	1.88	1.93	1.97	2.0	2.06	2.10	2.18	2.20

7.4. 6 m height of a diversion weir has 137 m net length. Maximum and minimum design discharges are given as 812 m³/s and 23 m³/s, respectively. **Find the head of the spillway.**

w/h_{max}	0	0.1	0.2	0.3	0.4	0.5	1.0	3.0
c_0	1.71	1.9	1.99	2.04	2.07	2.11	2.15	2.18

h/h_{max}	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.4	1.6
c/c_{max}	0.82	0.88	0.90	0.94	0.97	1.0	1.02	1.05	1.07

7.5. Crest elevation and a net crest length of diversion weir are 860 m and 55 m, respectively. When the flowrate is 430m^3/s, the tailwater level at downstream of the diversion weir is 861.5 m. In a free-flow condition, the spillway coefficient is 2.16 with considering project flowrate. **Find the raised water elevation.**

a/h	0	0.2	0.4	0.6	0.8	0.9	1.0
C_s/C_0	1.0	0.938	0.956	0.907	0.775	0.621	0.600

7.7 A diversion weir height of 8m and maximum spillway head is 4m. Draw the crest profile of an overflow spillway according to Creager's method.

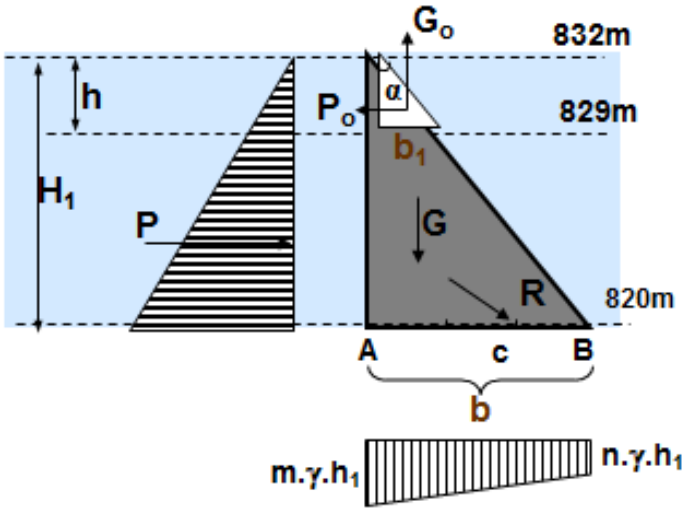
Table 1. Dimensionless crest profile values

x/h	-0.3	-0.2	-0.1	0
y/h	0.125	0.035	0.005	0

Table 2 Coordinates of Crest profile

x	-1.2	-0.8	-0.4	0	1	2	4	6	8	10
y	0.5	0.14	0.02	0	0.155	0.54	1.88	3.9	6.55	9.78

7.8 A diversion weir with maximum raised water elevation is at 832m, crest elevation is at 829m and riverbed elevation is at 820m. Find the relative base width of the weir under no tensile stress condition. (m=0.7, n=0.1, $\gamma_c = 2.4t/m^3$)

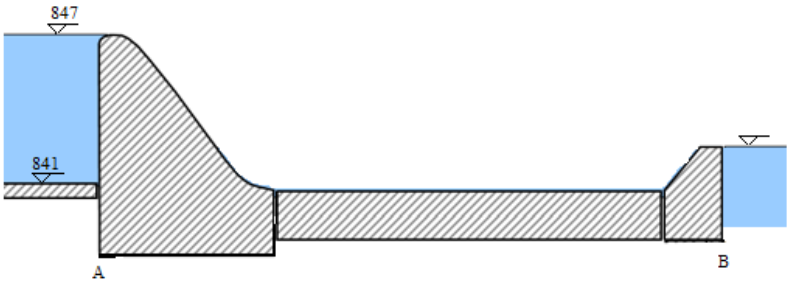


7.9 A diversion weir is planning to construct on a gravel bed. Analyze the stability of the whole structure shown in Figure. Make stability controls against overturning and sliding. The friction coefficient (f) is 0.4, the length of the stilling basin is 12 m, the specific weight of concrete underwater is $\gamma_e = 1.1t/m^3$, active soil pressure coefficient (λ_e) is 0.3, safety stress for soil is $\sigma_e = 25t/m^2$, m=0.7,n=0.25, $\gamma_c = 2.4t/m^3$). (Figure is given on page 101 and the required safety factor can be taken as those of normal loading case)

7.11 A gated diversion weir has three-wheeled horizontal gates. The raised water level is 5.00 m and the gaps of the gates are b=6.00 m. If the gates are lifted 1.25 m, Determine the flowrate under the gates for free-flow conditions.

7.12 A gated diversion weir has b=3m net gap between ten gates. When the gates are open at a=1.6m, the downstream water level of the weir is h=5.8m at the stilling basin. Determine the submerged flow conditions, calculate the total flowrate under the Gates.

7.16. A diversion weir as seen in Figure is planning to construct on a clay-sand bed. Make analyzes of the diversion weir with using the Lane method (C = 4). If there is no water at the downstream section of the weir. Determine decrement factors (m, n) of water pressure.



7.17. A diversion weir as seen in Figure is planning to construct on a fine-gravel bed. Make analyzes of the diversion weir with using the Lane method (C = 4). Determine the length of the sheet pile. Control the width of the stilling basin if it is sufficient or not.