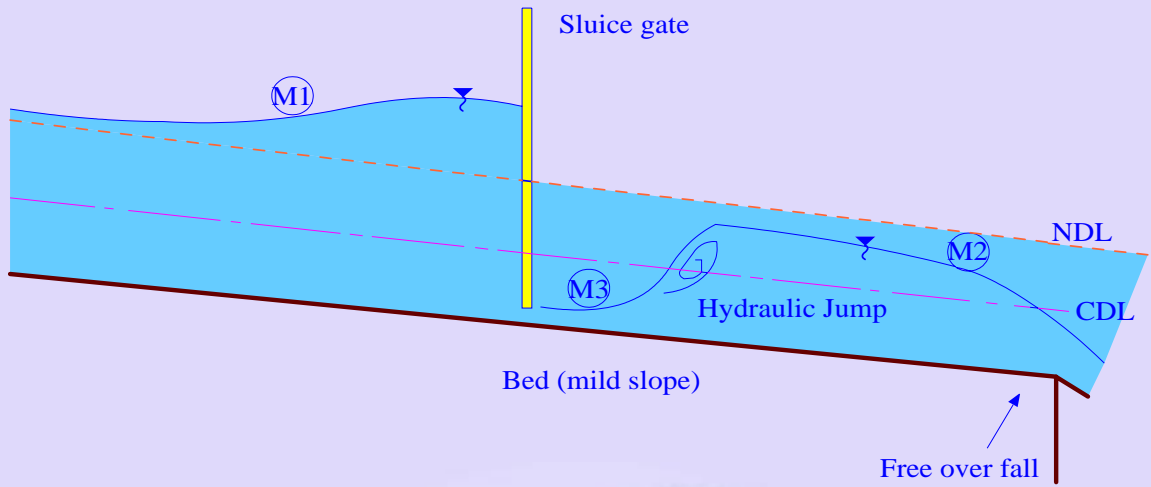


24.1 Real Life Cases of Water Surface Profiles

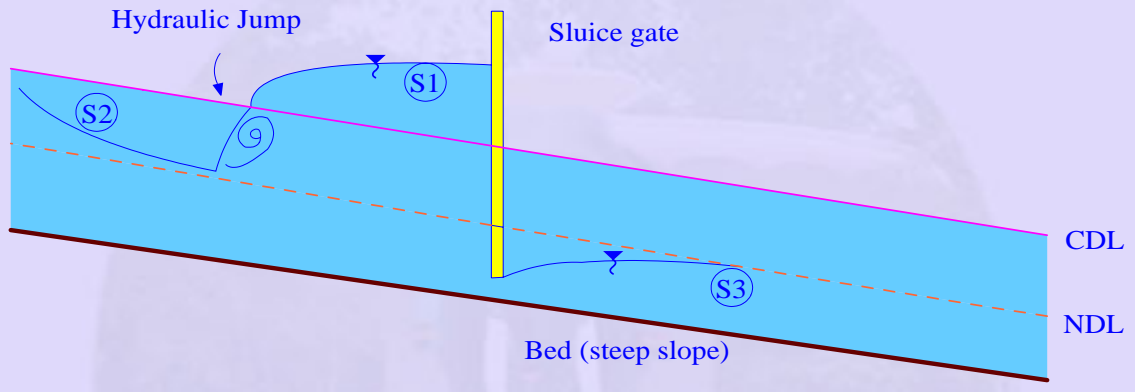
It is interesting to see how water surface profiles discussed in the unit 23 occur in real life. For example, an M1 profile occurs behind a dam or a sluice gate located on a mild channel. The dam or a sluice gate piles up water behind it such that the flow depth is greater than the normal depth. Far away from the dam or sluice gate on the upstream side, the flow would be occurring under uniform conditions and the flow depth would be normal. In a similar manner, S1 and C1 profiles occur on the upstream side of a sluice gate located on a channel with steep and critical slopes, respectively. An M2 profile occurs on the upstream side of a free over fall at the downstream end of a mild channel since a critical depth occurs in the vicinity of a free over fall. Similarly, a H2 profile occurs on the upstream side of a free over fall at the downstream end of a horizontal channel.

Critical flow conditions occur at the entrance to a steep channel from a lake or a reservoir. However, flow should tend towards uniform flow conditions far away from the entrance if the channel is long. Therefore, a S2 profile occurs in steep channels, on the downstream side of the entrance. A few real life cases of water surface profiles are shown in Fig 24.1.

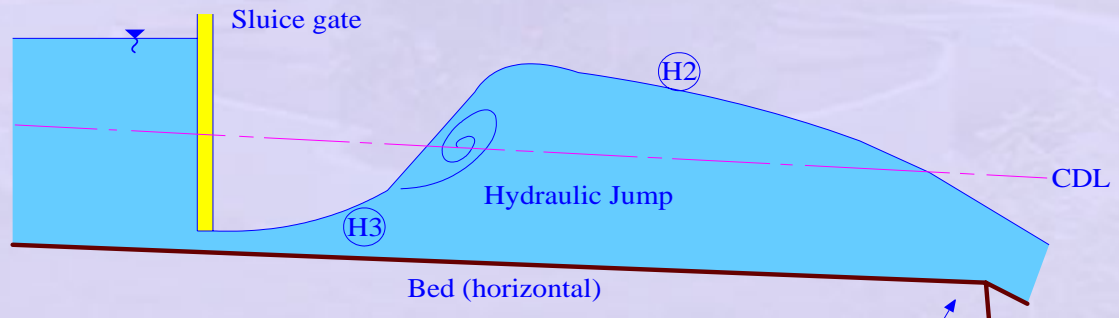




(a) M1, M2 and M3 profiles



(b) S1, S2 and S3 profiles



(c) H2 and H3 profiles

Figure 24.1: Real-life cases of water-surface profiles