Unit –III

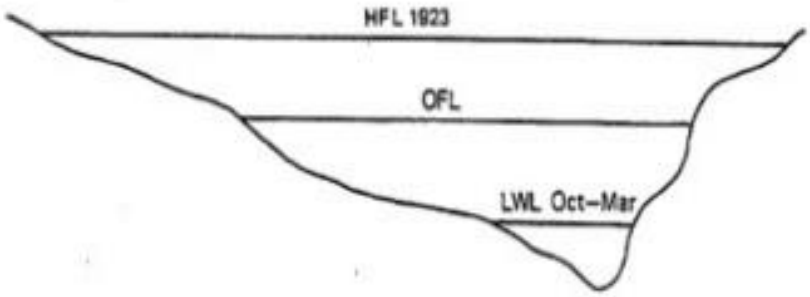
Bridge Site Investigation and Planning

Location of the Bridge (contd.)

- Appropriate horizontal alignment of the road to be connected (no sharp curves in approach)
- Appropriate vertical alignment
- Absence of expensive river training work
- Absence of excessive underwater construction
- Traditional crossing point

River Survey

- **Obtain the following data:**
  - **Ordinary Flood Level (OFL)**
  - **Lowest Water Level (LWL)**
  - **Highest Flood Level (HFL) - highest known flood is termed the high flood (HF)**
  - **Design Flood Level (DFL) - The annual high flow is termed the design flood**



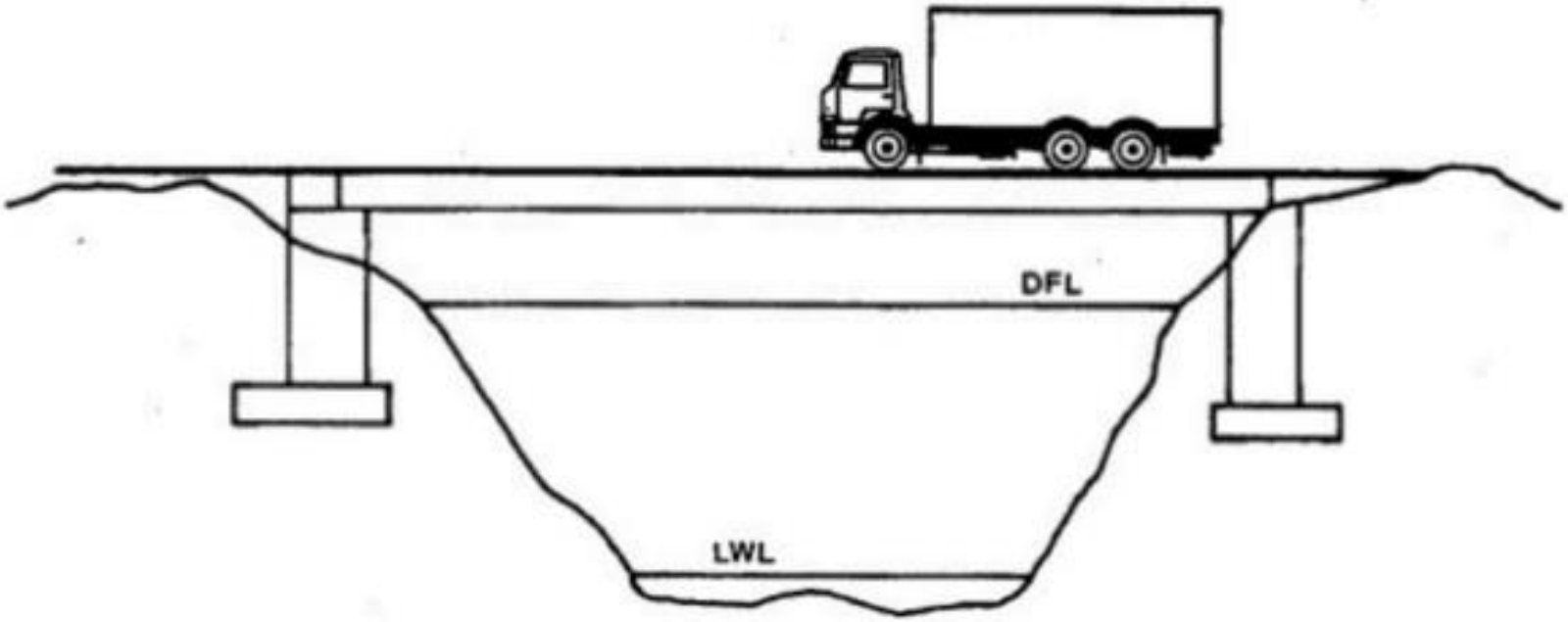
River Flow

Maximum discharge to be estimated by;

- **Empirical formulae**
- **Rational method**
- **Area-velocity method**
- **Records of flood discharge**

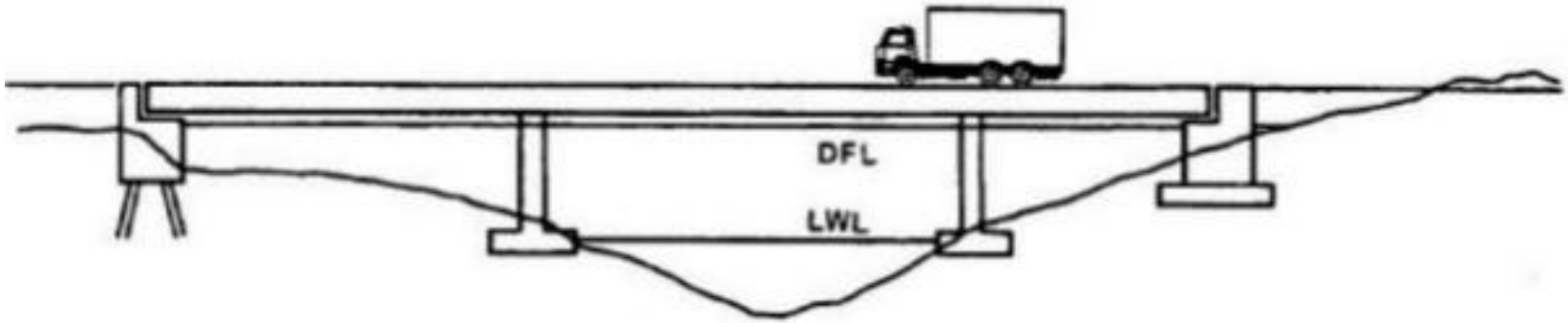
It is preferred to estimate the flood discharge by at least two of the above methods

Hydraulic Design



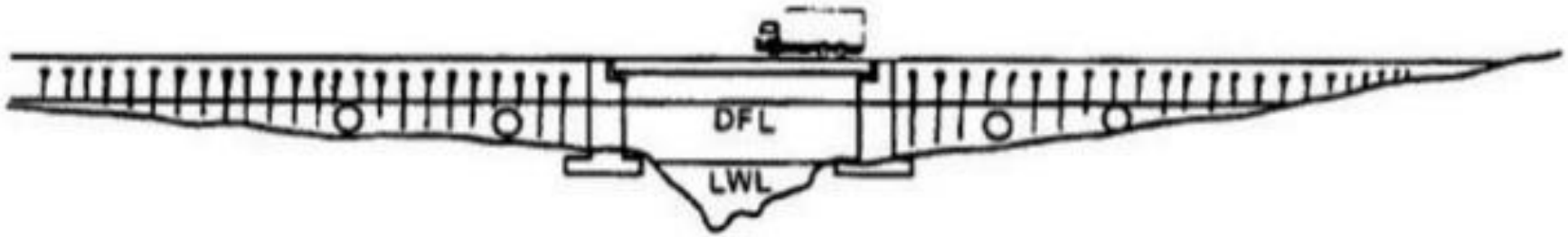
a) Incised river channel

Hydraulic Design



b) Wider flood channel

Hydraulic Design



c) Wide flood plain

Vertical Clearance at DFL

Vertical Clearance is required to,

- **Allow for errors in estimation of High Flood Level (HFL)**
- **Allow for floating debris**

Discharge (m3/s)	Minimum Vertical Clearance (mm)
< 0.3	150
0.3 to 3.0	450
3.0 to 30.0	600
30 to 300	900
> 300	1200

Scouring

- Scour is the erosive effect of water flow on the river bed or banks.
- Scouring occur when the velocity of the stream exceeds the limiting velocity of the particles in the stream bed could withstand
- Bridge works may alter the existing scour pattern by restricting the free flow of the stream.
- About 50% of river bridge failures are due to scour

Scour Protection

Scour Protection

Scour Protection