DESIGN & ANALYSIS OF DECK SLAB BRIDGE

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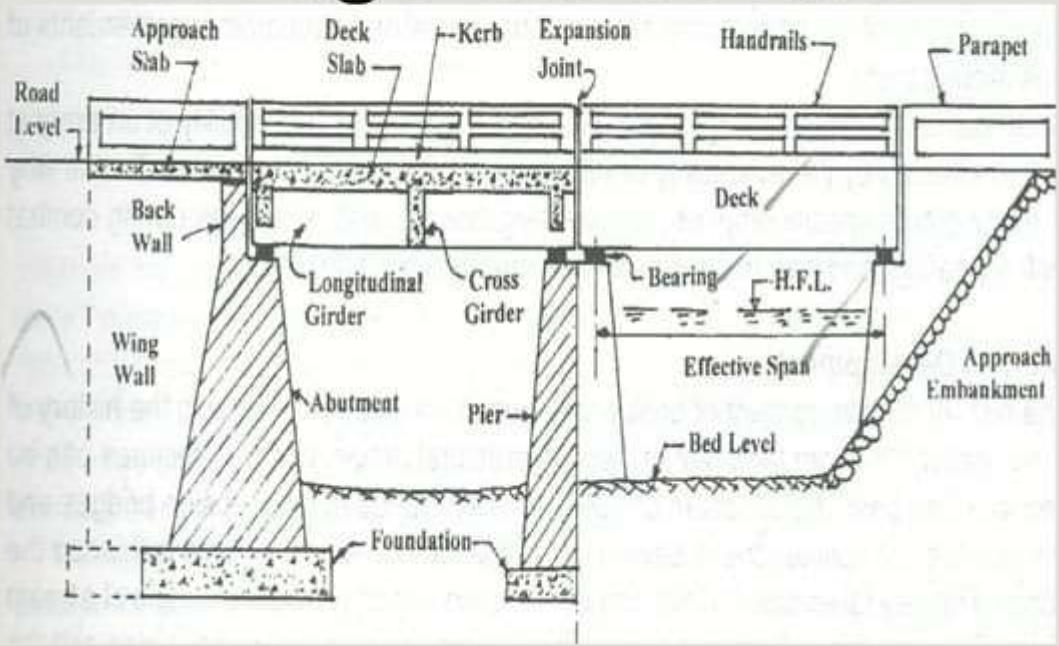
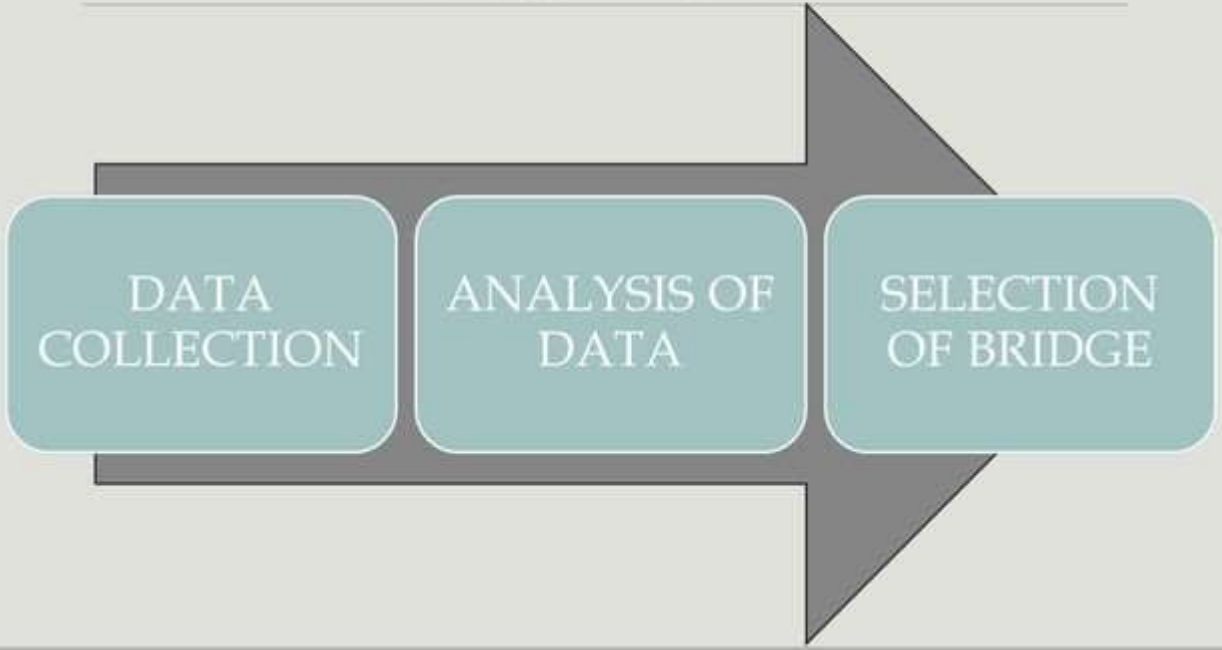
Purpose Of Bridge

- A bridge is a structure providing passage over an obstacle without closing the way beneath.
- The required passage may be for a road, a railway, pedestrians, a canal or a pipeline.
- The obstacle to be crossed may be a river, a road, railway or a valley.

Components of Bridge Structure



PLANNING FOR BRIDGE



DATA COLLECTION

- Location of bridge site.
- Transportation of bridge site.
- Nature of crossing and affordability.
- Availability of local material.
- Traffic volume.
- Availability of local bridge builders.
- Temporary crossing.
- Local participation.

ANALYSIS OF DATA

- Shortest distance for bridge.
- Economical span.
- Scour Depth.
- Vertical clearance.
- Traffic Projection.

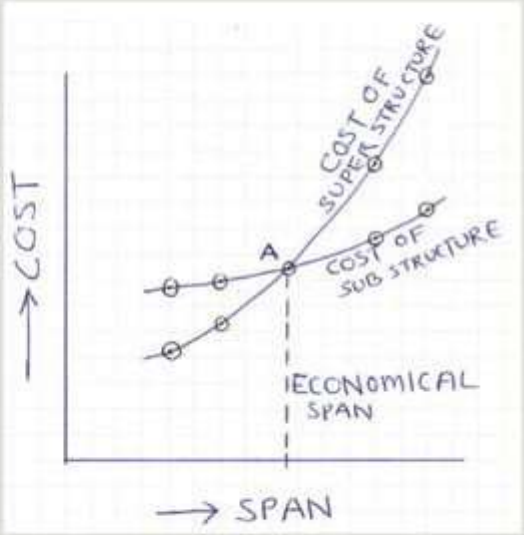
SHORTEST DISTANCE FOR THE BRIDGE

To construct a bridge the first part of analysis is to decide the shortest route for the bridge from starting point to the end point. & whether it is necessary & economical to construct a bridge. In this part of analysis, curves ends of river are excluded so as the distance will decrease between the ends of bridge unless there is no other plan is possible for the bridge.

ECONOMICAL SPAN

Economic Span Depend Upon The Cost Of:

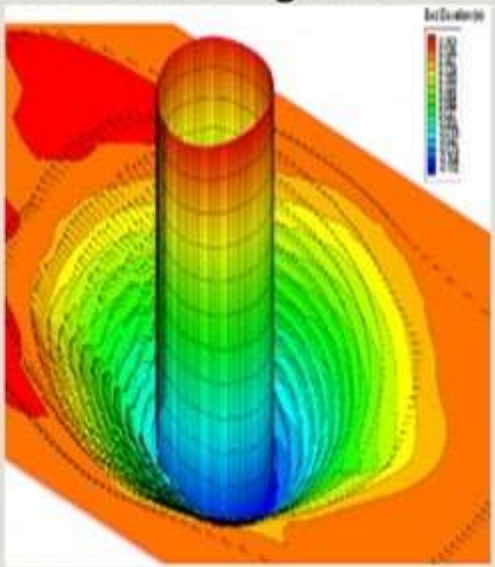
- Substructure
- Superstructure



SCOUR DEPTH

The depth which is produced due to the scouring action of water.

- Depth of scour below the High Flood Level
- Scour depth has importance in determination of depth of foundation
- If mean score depth is 'd', then max scour depth for piers is '2d'



VERTICAL CLEARANCE

- Minimum vertical clearance of 5m should be ensure over the full width of roadway.
- The vertical clearance should be measured with regard to the highest point of carriageway.
- Allowance for any future raising of pavement is also be made.

TRAFFIC PROJECTION

Analysis of traffic is also necessary for the bridge designing. Traffic projection defines the amount of traffic passing through the bridge. This helps in estimating the type of loading. Sometimes in case of emergency the amount of traffic increases so that a sufficient space is provided for the vehicles to go through the bridge without facing any problems.

SELECTION OF BRIDGE TYPE

- Geometric condition of the site(road alignment, design flood and highest water mark)
- Traffic capacity.
- Structural stability.
- Foundation conditions and strength of a abutment.
- Available material.
- Knowledge and equipment of the contractor.
- Clearance requirement above and below the road way.
- General requirements with respect to location ,financing and community values.

What is deck slab bridge?

- A bridge with an upper horizontal beams that carries Roadway or Railway is known as 'Deck' of the Bridge.
- In Deck Slab Bridges, the deck itself is the structural frame or the entire deck is thin beam acting entirely as one primary member. These types are used where the depth of structure is critical factor.
- A slab deck is one where the deck is analyzed as a plate. If the slab has the different stiffness in two directions right angle to each other, the bridge is analyzed as the orthotropic deck and the bridge is known to be the Deck Slab Bridge.

Deck slab bridge

BRIDGES-STRUCTURAL DESIGN

Loading Classification

- IRC Class AA Loading or Class 70-R Loading
- IRC Class A Loading
- IRC Class B Loading – adopted for temporary structures only

Loads, Forces and Stresses:

- Dead loads
- Live Loads
- Snow Loads
- Impact & dynamic Loads
- Earth Pressure
- Vehicle Collision Loads
- Wind Loads
- Impact Due to Floating Bodies
- Water Currents
- Centrifugal Forces
- Live Load Surcharge
- Buoyancy
- Temperature Effects
- Deformation Effects
- Secondary Effects
- Seismic forces
- Wave Pressure
- Grade Effects

THANK YOU