

Sliding Bridge and Move to Upward Direction

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Abstract: *A sliding bridge is a movable bridge structure designed to provide efficient connectivity while allowing passage for water traffic or accommodating changes in environmental conditions. Unlike conventional fixed bridges, a sliding bridge operates by moving horizontally along guided tracks or rails, enabling it to open or close as required. This mechanism is particularly useful in areas with fluctuating water levels, heavy boat traffic, or space constraints.*

The system typically consists of a bridge deck mounted on rollers or bearings, a guiding rail system, and a driving mechanism such as electric motors or hydraulic actuators. When activated, the bridge slides to one side, creating a clear passageway for vessels. Once the passage is complete, the bridge returns to its original position, restoring connectivity for pedestrians or vehicles.

Sliding bridges offer advantages such as efficient space utilization, reduced structural complexity compared to vertical lifting bridges, and adaptability to modern urban infrastructure. They are widely used in docks, ports, and canal crossings. Overall, the sliding bridge system provides a practical, flexible, and reliable solution for balancing transportation needs over both land and water.

Keywords: Sliding mechanism, Movable bridge, Linear motion, Guide rails, Rollers / bearings, Horizontal movement, Expansion and contraction, Load transfer, Structural stability

I. INTRODUCTION

A sliding bridge is a movable bridge structure designed to adjust its position horizontally to provide access across obstacles such as rivers, canals, or docks. It operates on a sliding or rolling mechanism, allowing the bridge deck to move forward or backward along tracks or guides.

This type of bridge is commonly used in areas where water levels change frequently or where temporary access is required. The sliding movement helps maintain a safe and stable connection between two points without the need for permanent fixed structures.

Sliding bridges are typically supported by rollers, rails, or mechanical systems such as hydraulic or motor-driven arrangements. These systems ensure smooth movement, reduce structural stress, and improve durability.

II. PROBLEM STATEMENT

A landing bridge is used to provide safe access between two points, often in areas where the water level changes, such as rivers, dams, or coastal regions. During conditions like heavy rainfall, flooding, or tidal rise, the water level may increase and come into contact with the landing bridge. In such situations, it is essential that the bridge moves upward automatically to prevent submergence, structural damage, and risk to human safety.

III. METHODOLOGY

sliding bridge is designed to move horizontally to connect or disconnect two points, often used over water bodies or variable access areas.

1. Structural Design

The bridge is supported on rollers, rails, or sliding bearings.



Materials like steel or RCC are used for strength and durability.

2. Track or Guide System

A rail or guide track is installed on the base structure.

Ensures smooth and controlled horizontal movement.

3. Movement Mechanism

Movement is achieved using:

Manual system (push/pull)

Mechanical system (gears, winch)

Motorized system (electric motors)

4. Sliding Operation

The bridge slides horizontally to:

Open → allow boats/traffic below

Close → allow pedestrians/vehicles to cross

5. Locking Arrangement

After positioning, locking devices secure the bridge.

Prevents unwanted movement and ensures safety.

6. Safety Features

Includes stoppers, sensors, and brakes.

Maintains stability during operation.

IV. CONCLUSION

A sliding bridge is an effective and adaptable structure designed to accommodate variations in water levels and movement between connected points. Its sliding mechanism allows smooth horizontal or inclined movement, reducing structural stress and ensuring continuous connectivity. This type of bridge enhances safety, flexibility, and durability, especially in areas affected by tides or fluctuating water levels. Overall, the sliding bridge provides a practical, efficient, and reliable solution for modern waterfront and transportation needs.

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