

**Vishwakarma Government Engineering College,
Chandkheda
Applied Mechanics Department**

Pambhan Bridge

Salient features:

- New Pamban Railway Bridge (2025, vertical-lift)
- India's first vertical-lift sea bridge; total length $\approx$ 2.07 km with $\sim$ 100 spans.
- Navigational lift span 72.5 m that can be raised $\sim$ 17 m for ship passage; bridge deck set $\sim$ 3 m higher than the old bridge.
- Substructure is designed for two tracks (presently operating as single line).
- Opened 6 Apr 2025, replacing the old rail bridge for traffic across the Palk Strait. [Indian Railways+3Press Information Bureau+3Press Information Bureau+3](#)

Old Pamban Rail Bridge (1914–2022, Scherzer bascule)

- India's first sea bridge (opened 1914); length $\approx$ 2.065 km with $\sim$ 143–144 piers.
- Mid-channel double-leaf Scherzer rolling bascule; each leaf $\sim$ 415 t, manually operated, taking $\sim$ 45 minutes to open/close.
- Rail traffic suspended Dec 2022 due to corrosion; being decommissioned after the new bridge's commissioning. [Wikipedia+1](#)

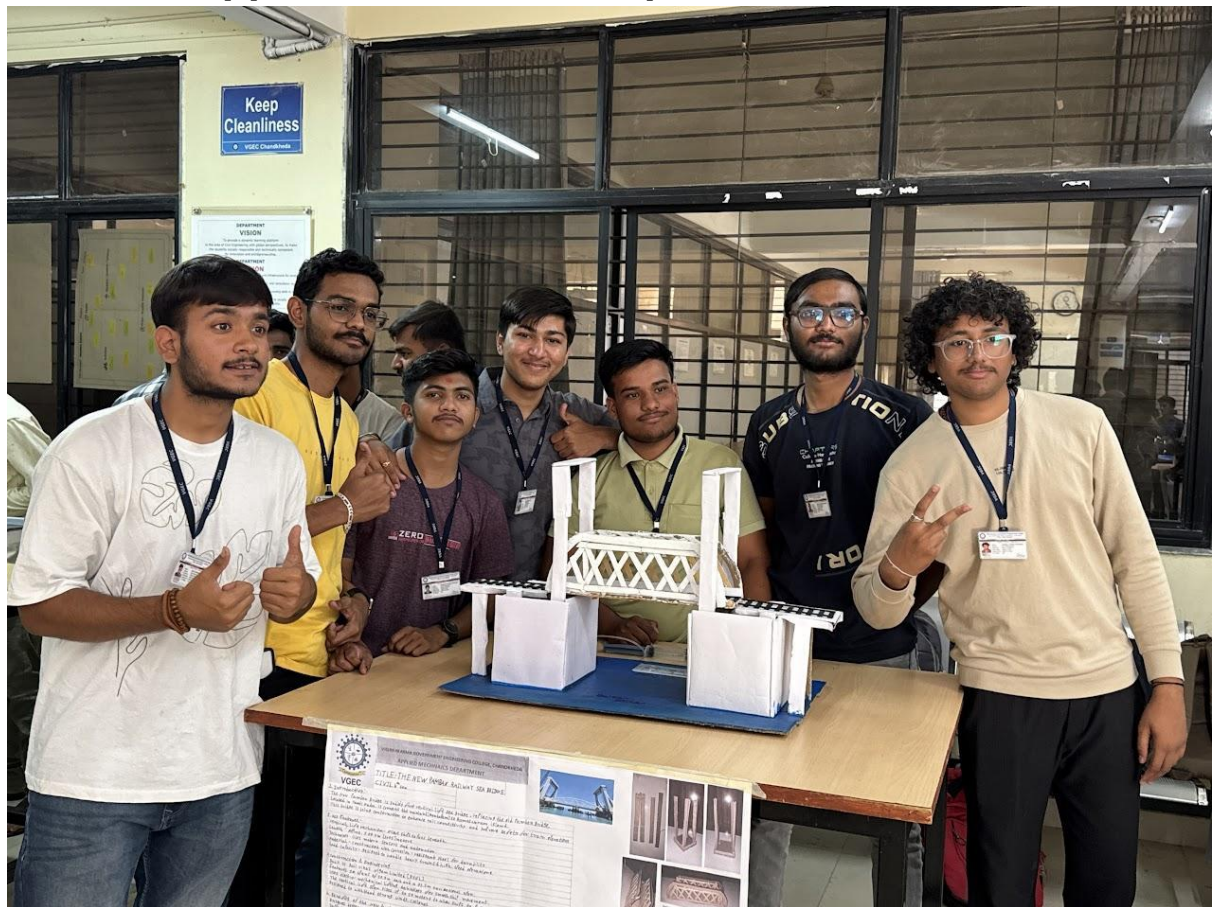
Annai Indira Gandhi Road Bridge (Pamban Road Bridge, 1988)

- Parallel road bridge of about 2.34 km, providing road connectivity between Mandapam (mainland) and Rameswaram (Pamban Island). [Tamil Nadu Tourism](#)

Context & environment

- The site is cyclone-prone with highly corrosive marine conditions, which drove the switch from a century-old bascule to a modern vertical-lift design that clears shipping faster.

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Beijing National Stadium (“Bird’s Nest”)

Salient features:

- Architects & team: Herzog & de Meuron with the China Architectural Design & Research Group; Ai Weiwei as artistic consultant; Arup as structural engineer.
- Role: Main venue of the 2008 Summer Olympics and 2022 Winter Olympics opening/closing ceremonies—Beijing became the first city to host both.
- Capacity: ~80,000 permanent seats (about 91,000 with temporary seating during 2008).
- Dimensions & site: Approx. 333 m × 294 m × 69 m, floor area ~258,000 m², set within the Olympic Green.
- Structure: Iconic interwoven steel lattice (“bird’s nest”); main steel body ~42,000 tonnes—a world-record-scale steel stadium.
- Roof & envelope: Original retractable roof was dropped; the roof skin uses ETFE (upper) with an acoustic membrane below.
- Sightlines & bowl: East–west stands are higher than north–south to improve viewing; farthest seat ~140 m (460 ft) from center.
- Sustainability systems:
 - Rainwater harvesting/recycling (underground collection & treatment).
 - Geothermal heat-pump integration for pitch heating/cooling; design emphasizes natural ventilation/daylighting.
 - Solar PV integrated at entrances (reported up to ~130 kW)

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