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## Modern Technology to Extend the Life Span of Bridge Structures

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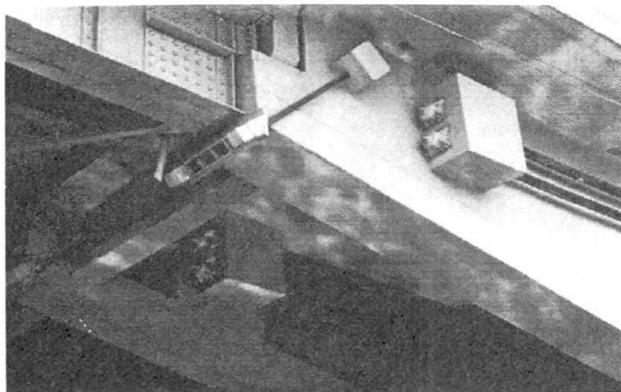
## Summary

This paper will present through few selected examples in Vietnam, Mexico and Romania how this upgrading and strengthening is achieved. Some specific methods and technologies have been developed : sometimes we replace poor quality or defective material by better quality material, or we attach an additional load-bearing material, or we may redistribute the loading actions through imposed deformation of the structural system. In any case, each project is unique and it appears that strengthening and repairing a structure is really an art.

### 1. The Tan Thuan bridge repair and strengthening in Vietnam

The Tan Thuan bridge is located north-east of Ho Chi Minh city. The total bridge length is 239 m and its total width is 12.50 m. It carries a 8 m roadway and two 1.26 m sidewalks.

The aim of the strengthening work was to enable heavy goods vehicles (container trucks) to cross both ways. The reinforcement techniques mainly involved the use of external prestressing both for concrete and steel spans.



*External prestressing strengthening*



## 2. Cerna bridge rehabilitation in Romania

This 6-span bridge, 10.60 m wide, was built in 1968 using balanced cantilever construction. The spans are distributed as follows :

$$26.60 + 4 \times 54 + 26.60.$$

Very soon, large deflections appeared at mid-span. In 1976 an additional surfacing was done to compensate the deflections. In 1979 hinges were replaced.

The statical scheme has been transformed : no more hinges but a continuous deck. This requested, of course, to create a physical separation between piers and deck. Consequently the piers were cut, the continuous bridge deck lifted and sliding bearings placed in between. Diaphragms were prestressed with external cables and bars.