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Structural Response of Represtressed Preflex Beams and Box Girder Bridges

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Summary

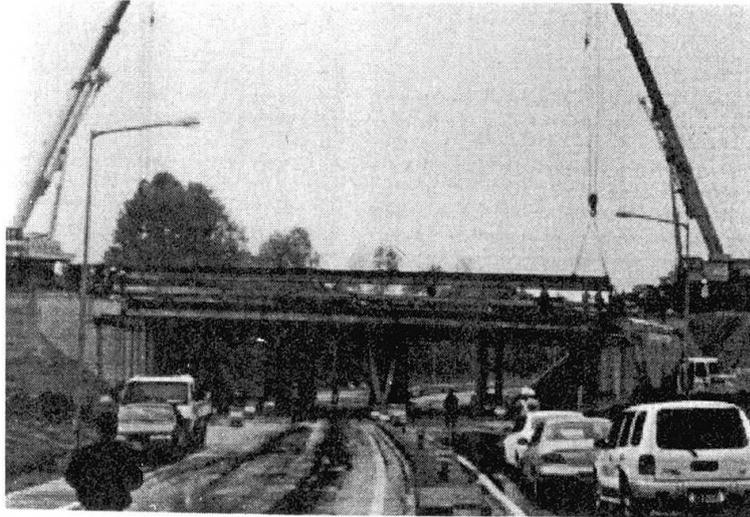
The conventional preflex beams are based on the method of partial prestressing, and allow the tensile stresses at the lower concrete of beams. As a consequence, many preflex beams experience the tensile cracks under the service loads.

Introducing additional prestressing called 'represtressing' at the lower concrete of beams, there could be accomplished control of crack problem. For analysis and design of experiment and improved beam, Design and Analysis Program of Represtressed Preflexional Composite Beam (DARP), was developed. In the experiment, two actual sizes of represtressed beams were tested under the imitated service loads. The results of test have shown that the performance of the represtressed preflex beams(RPF) are generally excellent for straight simple beams.

Although RPF do not experience the tensile cracks under the service loads, the use of this beam for the bridge structures couldn't apply for skewed bridges.

Therefore, newly invented box-type bridge, Represtressed Preflex - Box Girder Bridges (RP-Box Girder Bridges) are suggested for the skewed or long span continuous bridges. Adding the characteristic of low beam depth, high clearance and economical design of RPF, this suggestion of RP-Box Girder Bridges, is expected to contribute to practical and economic construction of bridges.

Keywords: represtressed preflex box girder bridge, preflex, tensile crack, ratio of displacement, torsion strength, bridge structure



Construction site of RPF, located in Jeonju, Korea

Type of Bridge	Developed Shape	Merits
Preflex 1949, by Lipski (Belgium)		Low depth ratio to 1/40
RPF 1995, by KICT (Korea)		Low depth ratio to 1/40 Full prestressing by strand
RP-Box 1998, by KICT (Korea)		Low depth ratio to 1/40 Full prestressing by strand Large twisting rigidity

The history of development of preflex composite bridges