

Second-Order Effects of External Prestressing Tendons on Steel-Concrete Composite Beams

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ABSTRACT

Steel-concrete composite beams are largely used in long-span bridges, many of which are experiencing damage problem. External prestressing tendons can effectively strengthen damaged bridges. However, the second-order effects of the external tendons will weaken the strengthening efficiency, while it is recognized that these effects can be reduced by steering blocks. In this work, a finite element model of prestressed composite beams with external tendons is developed in Abaqus, and verified by test data. The second-order effects of external tendons on flexural behavior are studied by setting various numbers of steering blocks. The paper reveals the influences of different combination of steering blocks on the bending behavior of externally prestressed steel-concrete composite beams.

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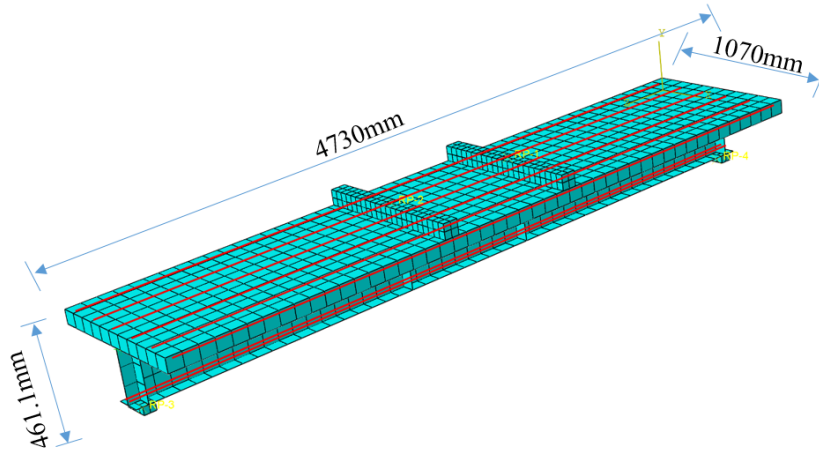


Fig. 1 Finite element model of steel-concrete composite beams

REFERENCES

- Lou, T., & Karavasilis, T. L. (2019). Numerical assessment of the nonlinear behavior of continuous prestressed steel-concrete composite beams. *Engineering Structures*, 190, 116-127.