



Mechanisms of Bond Creep of RC members

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Research Fields Concrete Engineering, Construction Materials.

Keywords Creep, Shrinkage, Crack, Sustained load, Bond

● Research Outline

Concrete structures form infrastructures such as bridges and dams. It is important to design and maintain structures so that they can be used safely over the long term. The width of cracks in concrete members is an important indicator. This evaluates the structural performance. Cracks open gradually over time. This is mainly caused by creep and drying shrinkage of concrete.

Since reinforcing bars and concrete share tensile forces by the bond in the tensile section of a member, creep against bond must be considered. That is called "bond creep" in this study.

We clarify (1) how much bond creep happens and (2) why it happens. These topics will be discussed by sustained loading tests using RC specimens. Moreover, (3) we develop a physical and mathematical model for bond creep based on the phenomenon.

In this study, we fabricated an apparatus for the loading test. It can apply a sustained tensile force to an RC specimen. We also fabricated a measurement device to measure the time-dependent deformation in the examination section of the RC specimen. The fabrication of such testing apparatuses for creep, shrinkage, and cracking of concrete is the technology that can be provided.

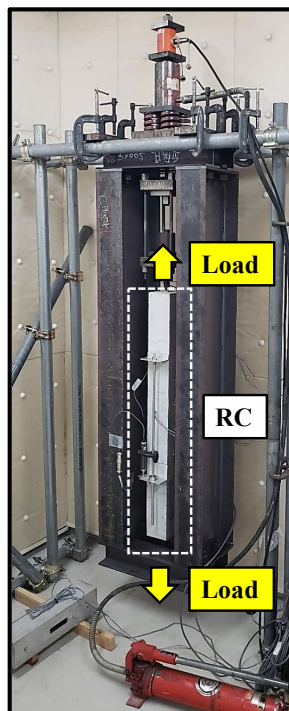


Fig. Apparatus for the loading test.

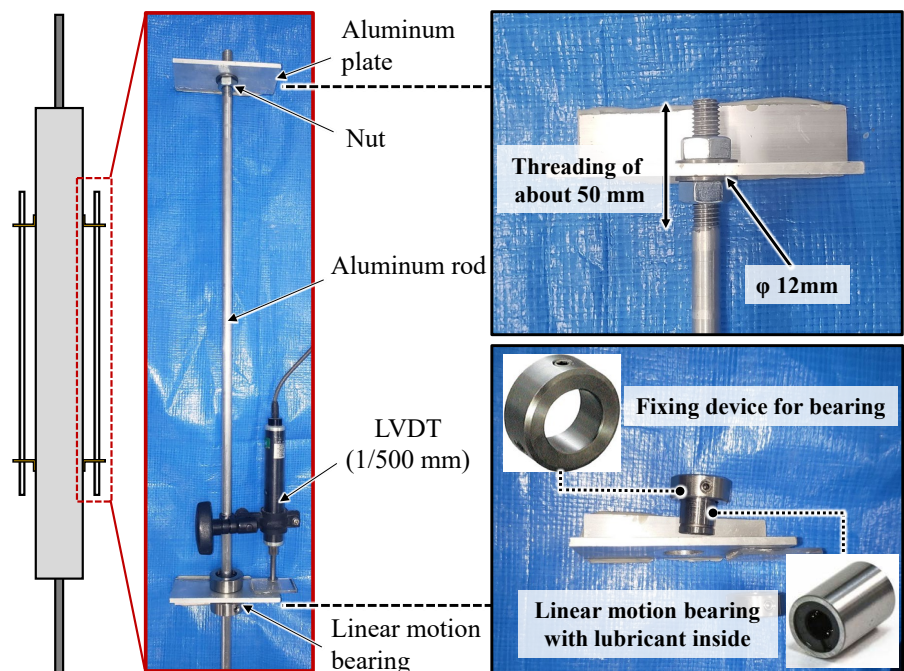


Fig. Measurement device.