

5. Developing an Automated Drilling Hole Device for Anchors - Automated Drilling in Reinforcement Work for Existing Concrete Structures -

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Methods for reinforcing existing concrete structures include the post-installed shear reinforcement method and thickness-increased method, among others. These methods typically involve the manual drilling of insertion holes for the post-installed shear reinforcing bars and anchor bars that enhance the integrity of the existing and new concrete. These holes are typically drilled using rock drills, electric hammer drills, or the like. In some cases, the number of holes to be drilled may reach several thousand. Thus, mechanizing and automating this drilling would contribute significantly to labor savings and efficiency. Another goal is to improve the working environment from scattered dust during work.

We developed two types of automated drilling hole devices to drill, respectively, large diameter and small diameter holes. These devices automatically drill holes according to a preset drilling plan (based on the number of specified drilled holes, drilling position, drilling depth) and record construction data. A cover installed at the tip of the rock drill and a dust collector prevent the scattering of dust generated by drilling. A performance test of these devices with an RC wall test specimen confirmed that performance was as expected.

Key words: reinforcement work, post-installed shear reinforcement, drilling, automation, rock drill, electric hammer drill