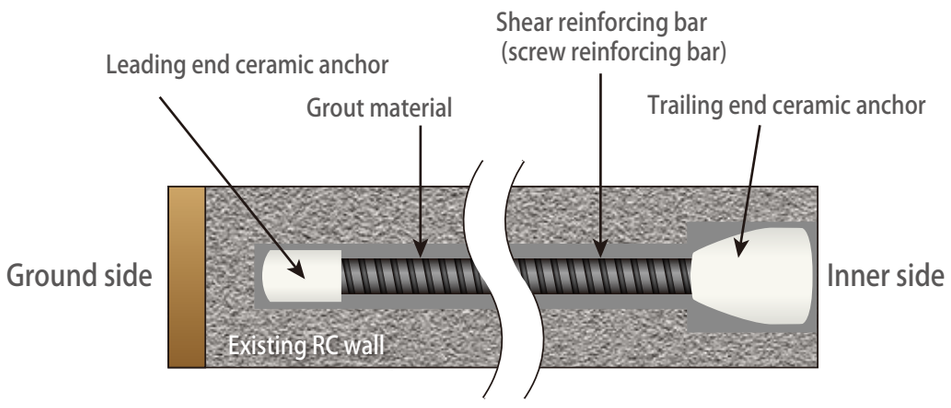
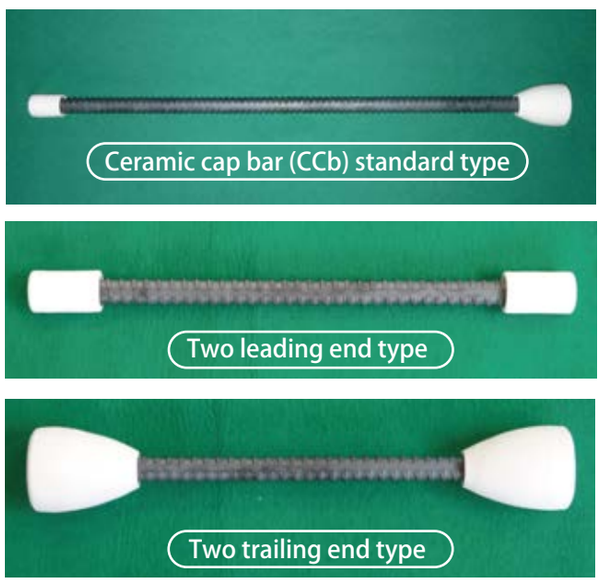
Post-construction reinforcement technology for underground structures making use of highly durable ceramics

Ceramic Cap Bar Method

The CCb method is a post-construction shear reinforcement method that inserts ceramic cap bars (CCb) with ceramic anchors installed at both ends of reinforcing bars for shear reinforcement, into established RC underground structures such as box culverts from the inside. CCb has high corrosion resistance and CCb can be set nearby the concrete surface, As a result, seismic retrofitting with high reinforcement efficiency and durability can be obtained.





Insertion of a ceramic cap bar (CCb)

Features

High efficiency of shear reinforcement

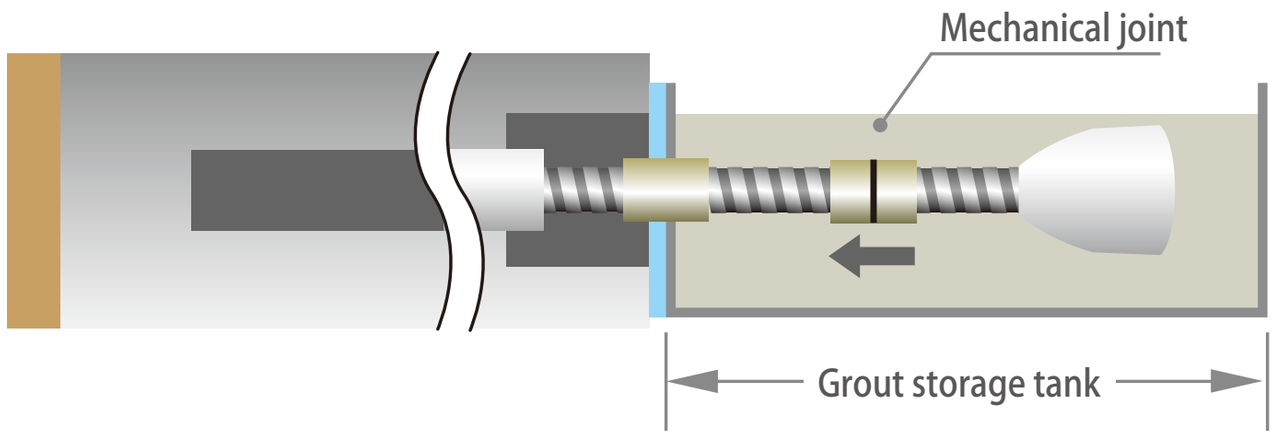
- Arranging the anchors near the concrete surface can provide higher reinforcement efficiency than that of conventional methods, and can result in a reduction of the number of arranged fixtures as well as an increase in the arrangement interval.

Excellent workability

- The caps and reinforcing bars are assembled on site.
- On-site handling is possible even when a change of the length of reinforcing bars is required.
- Split construction with mechanical joints is possible even in narrow places.

High durability

- Use of a cap made from high purity alumina ceramics, which is excellent in corrosion resistance, high durability after reinforcement can be obtained.
- Deterioration of the quality of the structure can be avoided, since no foreign matter is left in the hole during construction.



Construction drawing with mechanical joint

Application example

- Sewage treatment plant
- Water supply facility
- Viaduct
- River structure and others.

Construction at a narrow place (water treatment facility)

Reinforcement for a bottom plate of the gravity thickening tank

Overhead application (discharge channel)

KAJIMA CORPORATION