Claims

1. A breakwater structure, comprising:

a support plate configured to be installed on a seabed and to have an upper surface formed with a plurality of grooves;

a plurality of middle plates arranged in a plurality of layers, wherein each middle plate is configured to have an upper surface and a lower surface, a plurality of grooves formed on the upper surface and the lower surface of the each middle plate and a plurality of through-holes penetrating from the upper surface to the lower surface of the each middle plate, so that the plurality of grooves of one middle plate are vertically aligned with the plurality of grooves of another middle plate arranged at a layer above or below the one middle plate, and the plurality of through-holes of the one middle plate are vertically aligned with the plurality of through-holes of the another middle plate;

a plurality of pillars configured to be installed vertically between the support plate and a lowermost middle plate of the plurality of middle plates and between the plurality of middle plates positioned one above the other, by fitting into respectively two vertically opposing grooves of the plurality of grooves formed on the support plate and the plurality of middle plates;

a plurality of through-rods each configured to pass vertically through the middle plates, and each of the through-rods has one upper end and one lower end, and the one lower end is fixed to the support plate;

a tie rod configured to supportively interconnect at least two pillars to group the at least two pillars;

a plurality of fasteners configured to fasten contact portions between the tie rod and each of the at least two pillars; and

a cover plate configured to be stacked on an uppermost middle plate of the plurality of middle plates and to fix the one upper end of the each of the through-rods,

wherein the group of the at least two pillars with the tie rod is modularized to

be installed between the plurality of middle plates.

2. The breakwater structure as claimed in claim 1, wherein the tie rod is configured to be placed in parallel with at least one of the plurality of middle plates.

3. The breakwater structure as claimed in claim 1, wherein the tie rod is configured to be installed obliquely across the plurality of pillars from one pillar at an upper portion to another pillar at a lower portion.

4. The breakwater structure as claimed in claim 1, wherein the plurality of pillars are configured to be installed vertically between the uppermost middle plate and the cover plate.