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【ABSTRACT】

A tunnel excavation technique using a water jet. A water jet system includes a moving unit movable back and forth with respect to an area to be blasted for tunnel excavation, an articulated robot arm mounted on the moving unit, a water jet nozzle which ejects high-pressure water and an abrasive toward an area to be excavated, and a control unit which controls the moving unit, the articulated robot arm and the water jet nozzle. A free face having a predetermined depth is formed of the area to be excavated in the direction in which the tunnel is to be excavated using the water jet system. Since the blasting is performed after the free face is formed, blast vibration can be effectively restricted.