

5. Development of Paddle Type Rectangular Tunneling Machine -Box Type Roof Construction Technology in R&C Method-

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Rectangular tunneling machines are indispensable for box type roof construction in the R&C method. We have developed a paddle type rectangular tunneling machine to reduce the cost of square pipe roof construction and to enable dry excavation with the processing of underground obstacles inside the machine. The excavation cross section of this tunneling machine is 800 x 800 mm. Top and bottom paddle cutters are mounted horizontally, and continuous excavation is possible. The excavated earth is removed via a belt conveyor. As a result of a performance validation experiment and field validation experiment on this tunneling machine, the following were confirmed:

- i) Efficient excavation and earth removal are possible in the dry condition.
- ii) Residues in the corners are small, and directivity is good.
- iii) Earth ranging from cohesive to gravely condition can be excavated.
- iv) A reduction in facility cost is obtained.

Key words : R&C method, box type roof construction technology, rectangular tunneling machine, dry type excavation, paddle cutter