11. The Research of High Strength Concrete Explosion Prevention Method by the Covering.

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Recently, the explosion of the high strength concrete by high temperature heating in the fire is doubted. The method for mixing the resin fiber into the concrete as explosion countermeasure of the high strength concrete has already been proposed. However, it is not possible to prevent the degradation of the structure body by receiving the high-temperature hysteresis, in this method, and it is necessary to change most of concrete and reinforcing steel in the repair after it received the fire injury. Then, element experiment and thermal analysis and loading heating test were carried out in order to examine the method for preventing the explosion by suppressing temperature transmission to the structure body by equipping the member surface with the protective layer. As the result, a following knowledge was obtained.

The existence of explosion generation of the high strength concrete is dependent on not only height of the temperature but also temperature rise speed.

High strength concrete column of this experiment satisfies the fireproof 3 hour performance in spite of the existence of the covering.

By the covering of the calcium silicate board, it is possible to prevent the explosion at the 25mm thickness for 3 hours, and it is possible that the explosion is prevented even in the 15mm thickness in about 2 hours. And, it is possible to also prevent the strength degradation in concrete surface in case of the 25mm thickness.

By carrying out the thermal analysis based on the element experiment, it is possible to estimate the existence of the explosion.

Key words : high strength concrete, explosion, fireproofing, covering, thermal analysis