

## 日本东京消防局发布 《东京消防白皮书 2020》

日本东京消防局 2021 年 5 月 14 日发布了《东京消防白皮书 2020》。白皮书指出,东京消防局共拥有 2 078 辆消防车船(不包括其他组织拥有的车辆),车辆类型包括泵浦车、云梯车、化学车、水域消防艇、大型消防救助艇、指挥艇、化学消防艇、救护车、救援车、地震救援车(用于地震灾害对策)、飞机救援车(用于装载飞机)、水域救援车、山岳救援车、特殊灾害处置车、先行车、电动轻型先行车、消防摩托车、直升机、重型救援设备车、道路照明车等。

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**Abstract:** The numerical simulation of duct piece fire protection and the fire resistance experiment of flue plate were carried out based on Jiangyin Jingjiang Yangtze River Tunnel, and a new structural fire protection strategy was proposed. It is suggested that the shield section of pavement segments should be protected, and all the shield section of smoke pipe should be protected by concrete lining. However, no fire protection is required for flue sheet. The numerical simulation results of duct piece showed that when the equivalent thermal resistance of the fire protection layer is greater than  $0.10\text{ }^{\circ}\text{C}\cdot\text{m}^2/\text{W}$ , the fire resistance limit of duct piece exceeds 2.0 h. The fire test results of flue sheet showed that under the action of RABT heating curve, the mid-span deflection of non-fire protection flue sheet is smaller than the fire resistance limit deflection, and the fire resistance limit exceeds 2.0 h. The results of simulation and experiments showed that this new fire protection strategy of the top centralized smoke exhaust shield tunnel structure is safe and feasible.

**Key words:** top centralized smoke exhaust; shield tunnel; fire resistance of structure; numerical simulation; fire resistance test

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(2)排烟道内部拱顶部位管片防火保护层等效热阻应大于  $0.1\text{ }^{\circ}\text{C}\cdot\text{m}^2/\text{W}$ ,此时结构耐火极限大于 2.0 h,可设置整体长度混凝土内衬进行防火保护,内衬厚度大于 80 mm。

(3)行车道板下部管片火灾下处于安全状态,不需施加防火保护。

(4)火灾条件下烟道板耐火极限大于 2.0 h,不需要进行防火保护,仅需火灾后对受火部位烟道板进行修复,PP 纤维混凝土烟道板耐火性能略优于钢筋混凝土烟道板。

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### Study on fire protection and key parameters of top centralized smoke exhaust shield tunnel structure

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