

越江公路隧道逃生区段设计

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摘要 如何在隧道设计阶段就考虑到运营中可能发生的火灾概率及损失, 结合人员逃生的速度及时间, 进行火灾逃生区段的设计成为一个亟待解决的问题。在城市公路隧道火灾条件下, 分析在一定时间内的三个关键影响因素——隧道内温度、有害气体浓度和能见度对疏散人员的生命造成的威胁, 以及安排疏散人员迅速撤离至安全区域的措施。以上海一越江隧道工程为例, 尝试运用火灾模拟软件FDS通过模拟隧道火灾发生时烟气状况, 得到危险条件临界时间 T_{fire} ; 结合隧道火灾时人员疏散模型Tunev模拟火灾发生时人员逃生所需要的安全疏散时间与逃生滑梯通行能力, 并以此来确定隧道疏散口间距与口部尺寸的初步设计, 完成逃生区段的设计方案。研究旨在对隧道的逃生救援口部设计提供一定的指导。

关键词 [隧道工程](#); [隧道火灾](#); [逃生救援](#); [人员疏散](#); [逃生通道设计](#)

分类号

FIRE-PROOF SECTION DESIGN OF RIVER-CROSSING ROAD TUNNELS

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Abstract

Tunnel fire becomes a hot issue, and the problem how to consider the future fire probability during the design of the tunnel is needed to consider. The fire-proof section has to be planned according to staff escape speed, but also depending on the essential time of escape. Three important factors of tunnel fire, i.e. the temperature, concentration of carbon monoxide(CO) and visibility, which will threaten people's lives seriously, are analysed. It is a key of evacuation route design to make people escape from dangerous area safely in a certain time. So the time when temperature, visibility and consistency of carbon monoxide in tunnel menace people's lives is also studied. From this point of view, adopting computational fluent dynamics software FDS and evacuation model Tunev(tunnel evacuation), the available safety egress time(ASET)and required safety egress time(RSET) with the example of Shanghai river-crossing road tunnel are simulated. Then, the preliminary sketch of the distance of the tunnel evacuation section and the capacity of the escaping staircase are also presented. Finally, the fire-proof section is designed, which may provide some references to the escape-rescue design of tunnels.

Key words [tunneling engineering](#); [tunnel fire](#); [escape-rescue](#); [staff escape](#); [escape passage design](#)

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