

金口垃圾填埋场内大型建筑物地基基础及安全性研究

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摘要 金口垃圾填埋场内拟建一大型垃圾中转站, 该垃圾填埋场还没有达到稳定化, 必然对建筑物地基基础结构及安全性有很大影响。通过垃圾土的室内土工试验、现场平板载荷试验以及边坡反分析, 对垃圾土的压缩特性、承载特性以及抗剪强度进行了研究, 得出了场内垃圾土是一种含有可降解有机质和大量纤维成分的疏松的无粘性的特殊软土, 具有高压缩性、不均匀沉降特性、抗剪强度较高和承载能力较高等工程力学特性。对建筑物的基础进行选型分析, 提出主体工程宜采用大直径钻孔灌注桩基础, 配套工程宜采用能承受较大变形和不均匀沉降影响的筏板基础, 而上部结构宜采用框架结构。根据经验公式, 计算垃圾土的负摩阻力后, 提出桩基设计时应考虑负摩阻力对桩基承载力的影响。通过化学测试及调研, 得出垃圾土具有中腐蚀性, 渗滤液具有强腐蚀性, 提出桩基础必须采取三级防护措施。垃圾渗滤液中含有污染物质种类多且浓度高, 分析了在桩基施工过程中渗滤液对地下水的污染途径, 提出包括全护筒支护、膨润土泥浆护壁以及减少钻孔成孔至灌注混凝土的间隔时间等控制污染的主要措施, 经理论计算分析, 这些措施能有效降低渗滤液对地下水的污染程度。对填埋场气体进行分析, 填埋场内已含有大量有害气体, 且仍处于产气高峰期, 提出施工前必须强行排气, 进行了特殊的覆盖层设计, 以保证工作人员及建筑物的安全。

关键词 [土力学](#); [垃圾土](#); [物理力学特性](#); [垃圾填埋场](#); [建筑物](#); [地基基础](#); [安全性](#); [城市固体垃圾](#)

分类号

RESEARCH ON FOUNDATION AND SECURITY OF THE EDIFICE IN JINKOU MUNICIPAL REFUSE LANDFILL

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Abstract

The aging process of Jinkou municipal refuse landfill in Wuhan city, China, is still in the unstable period, and it will greatly influence the foundation and security of the large-scale refuse transfer station which will be built on the landfill. Based on indoor geotechnical experiments, in-situ plate loading test and slope reverse analysis, the compressibility and the bearing capability and shearing strength of refuse soil are studied, and the refuse soil is defined as a kind of special loose cohesionless soft soil with organism and a great deal of fiber. The refuse soil is of high compressibility, uneven settlement

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characteristic, and high bearing capacity and shear strength. Foundation types for this case is discussed, the large-diameter bored pile foundation is chosen for the main part of project, and the raft foundation for annexes to deal with the problem of high and uneven foundation settlement. Based on the empirical formula, the negative friction caused by the settlement of landfill should be considered in the bearing capacity of piles. Based on chemical test and investigation in site, it is concluded that the refuse soil is of medium corrosively and the leachate is of intense corrosively to piles. Then, the three-level protective measures for reinforced concrete are put forward. There are plenty of pollutants of higher concentration in the leachate. After analysis on pollutant pathway to underground water in construction, major pollution-controlled measures are put forward, including whole-length steel tube timbering of bore, bentonite-mud protection of bore wall, and reduction of interval time between the ending of bore drilling and the beginning of concrete filling. Theoretic calculation shows that these measures are available to reduce the contaminated degree of underground water. There are plenty of poisonous gases in the landfill, and production of is still in the fastigium. The gases should be discharged before construction for long-term security of workmen and constructions, so a special cover layer is designed.

Key words [soil mechanics](#); [refuse soil](#); [physical and mechanical property](#); [municipal refuse landfill](#); [building](#); [foundation](#); [security](#); [municipal solid waste\(MSW\)](#)

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