

## 套管法拔桩对既有大直径地下污水管的影响

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## Effect of Pile Pulling in Casing on Established Large Diameter Waste Pipe

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**摘要** 套管法拔桩可以大幅减少施工对既有构筑物的影响.将拔桩全过程划分为压入套管、拔出桩体、拔出套管并回填3个阶段,利用通用的有限元程序ABAQUS软件,以上海轨道交通7号线5标区段内一根废弃桩为研究对象,分析套管保护条件下拔桩过程对既有大直径地下污水管的影响.桩体及套管采用弹性模型,土体采用Drucker Prager弹塑性模型.分析结果表明:套管压入过程中,污水管的水平位移和沉降随着深度增加不断增大;套管拔出并回填过程中,污水管的水平位移和沉降先增大,后趋于稳定;压入和拔出过程中,水平位移均为沉降的1/10左右.数值计算和现场监测的结果对比表明,计算结果可为工程施工提供有益指导.

**关键词:** [拔桩](#) [套管](#) [压入](#) [拔出](#) [回填](#)

**Abstract:** Effects of pile pulling on the surrounding structures is a common problem in construction projects. The effect can be reduced substantially if piles are pulled in casing. The overall process is divided into three stages including steel casing pressing, pile pulling, and steel casing pulling accompanied by refilling. We take an abandoned pile in Shanghai Rail Transit Line 7 as an example to study the effect on an established large waste pipe during pile pulling in casing. In the study, we use the general purpose finite element program ABAQUS based on the elastic stress-strain theory. The soil is simulated according to the Drucker-Prager elastic-plasticity stress-strain theory. It is shown that the horizontal and vertical displacement increases with the increase of casing depth during the pile pressing process, while with the decrease of casing depth during pile pulling process. The displacement of horizontal direction is one tenth of that of vertical direction. Comparison between the simulation results and the monitored data shows that the simulation is useful to the construction.

**Keywords:** [pile pulling](#), [casing](#), [press](#), [pull](#), [backfill](#)

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