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北京地区深基坑墙体变形特性研究

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RESEARCH ON CHARACTERISTICS OF RETAINING WALL DEFORMATION DUE TO DEI EXCAVATION IN BEIJING

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摘要 为明确北京地区深基坑开挖引起的墙体变形规律，对北京地区37个明挖顺作法基坑案例进行统计分析，并将分析结果与国内外类似工程进行对比。研究表明：(1) 墙体最大侧移主要为5～25 mm，所占比例为79.2%，大于30 mm的基坑较少，仅占13.5%。(2) 钻孔灌注桩深基坑开挖引起的墙体侧移表现为“中凸形”形，最大侧移距地表9～13 m，且基本位于0.58H±5 m范围。(3) 复合土钉墙基坑墙体侧移模式为“三角形”，最大侧移位于墙顶，沿墙身往下逐渐减小。(4) 所有基坑最大侧移为0.04%H～0.218%H，平均值为0.103%H。最大侧移随开挖深度、长宽比的增大而增大。(5) 最大侧移随插入比、支护体系刚度的增大而减小，当插入比大于0.6时，增大插入比对减小基坑变形效果不明显。研究成果可对未来北京及其他地区同类工程变形大小及安全性做出预测和评估，可指导设计与施工，对防止基坑事故、避免资源浪费具有重要意义。

关键词： 基坑工程 北京地区 深基坑 墙体变形特性 现场监测

Abstract： In order to clarify the law of lateral deformation due to deep excavation in Beijing，a database of 37 case histories of field monitoring in Beijing is analyzed and the results are compared with worldwide case histories. Research shows that：(1) The maximum lateral deformation of wall mainly ranges from 5 to 25 mm，with percentage of 79.2%；and only 13.5% of that are larger than 30 mm. (2) The general profiles of lateral deformation of bored pile wall are “convex shape”. The distance of position of maximum lateral displacement is from 9 to 13 m below top of wall，and ranges from 0.58H+5 m to 0.58H−5 m. (3) The profiles of lateral deformation of compound soil nail wall are “triangle shape”，with the maximum value at the top of wall and decreasing gradually down. (4) The maximum lateral deformations of all excavations，which range from 0.04%H to 0.218%H，with a mean value of about 0.103%H，increase with the increase of H and length-width ratio. (5) The maximum lateral deformation decreases with the increase of insertion ratio and system stiffness，but it has little effect when insertion ratio is more than 0.6. The results can be used to predict lateral deformation of similar projects in Beijing and other areas，and guide design and constructions；and it also has great significance to preventing the foundation pit accident and avoiding the waste of resources.

Keywords： foundation pit engineering Beijing deep excavation deformation characteristics of lateral wall field measurement

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