

## 台阶格栅加筋土墙土压力的模型试验研究

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收稿日期 2006-9-15 修回日期 2007-3-27 网络版发布日期 2008-1-30 接受日期 2007-7-15

**摘要** 为研究多级台阶式格栅加筋墙的工作机制和力学特性, 在室内修建一个长8.0 m, 宽3.0 m, 高4.5 m的模型槽。在模型槽中对3.0 m×1.5 m的3级台阶格栅加筋土挡墙和2种格栅网格尺寸进行系列模型试验。测试格栅加筋土挡墙面板后的土压力、加筋体后土压力、加筋土各分层土压力及地基应力等。试验发现加筋体内各点的土压力与传统的土压力理论计算值不一致, 土压力分布与基础条件及加筋体高度密切相关; 加筋体基础的位移对加筋体的力学特性影响较大, 它会引起加筋土体内应力的重分配, 即当位移较大时挡墙地基应力呈现V型分布, 较小时按斜线分布; 面板后侧竖向和侧向土压力沿墙高均呈现顶部和底部小中间大的外凸型分布, 加筋体后土压力亦有同样的趋势, 只是外凸程度较小; 加筋体内力学特性变化与格栅网格尺寸也有一定关联。

**关键词** [土力学](#); [加筋土](#); [模型试验](#); [土工格栅](#); [土压力](#)

分类号

## STUDY ON EARTH PRESSURES OF MULTI-STEP GEOGRID REINFORCED SOIL RETAINING WALL BY MODEL TEST

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### Abstract

An indoor model groove, which is 8.0 m long, 3.0 m wide and 4.5 m high, was built to study the mechanical properties of multi-step geogrid reinforced wall. A series of model tests have been performed on the three-step reinforced wall with each step 1.5 m in height with two types of geogrid reinforcements in the groove. The earth pressures near the wall-plate, rear reinforced body and horizontal profile, the compression stress of the bottom, etc. are measured. It is found that the test data of the earth pressure in different points are inconsistent with the values calculated by the traditional earth pressure theory; and the pressure is closely associated with the mechanical behaviors and the height of the wall. At the same time, the displacement of the base is greatly impacted on the mechanical behaviors of the reinforced body whose pressure will be redistributed, i.e. when the displacement of base is large, the distribution of the pressure in ground is V-shaped; otherwise according to slash distribution. And it is shown that the earth pressure behind the panel is distributed with greater value in the middle and less ones at the bottom and the top. So are the earth pressures in the back of reinforced body, but the amplitude of prominent is smaller. It is also shown the mechanical behaviors in the reinforced body will be changed as the aperture of grid.

**Key words** [soil mechanics](#); [reinforced soil](#); [model test](#); [geogrids](#); [earth pressure](#)

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