

吴兴征老师指导的 2013 级土木工程毕业设计列表（2017 年）

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1	弧形钢闸门主梁受力分析	2013443084	崔莹	
<p>泄水建筑物中的闸门是泄水通道的主要控制措施，可以起到控制水流流速，调节水位高度、排放泥沙等。在强降水或是地震作用下，闸门的安全性评估尤其关乎下游的直接或间接经济损失。闸门的主梁起着承受主要荷载的关键作用，为闸门的面板提供支撑。主梁的破坏会直接导致闸门的破坏，故这里将其作为研究对象。</p> <p>首先，针对静水压力和动水压力两种荷载作用，对弧形闸门主梁所受到的弯应力，剪应力和弯剪组合应力给出了计算公式。其次，结合主梁的材料强度特性，分析了主梁的失效模式，并给出了三种应力模式下（弯应力，剪应力和弯剪组合应力）的安全系数的计算公式。最后，将这些公式应用于湖北丹江口水库和四川瀑布沟水库的弧形闸门的分析中，绘制了作用水头与应力之间的关系曲线。</p> <p>该研究有助于把握闸门主梁的水位-荷载效应的变化趋势，并判断出静动力荷载作用下主梁的破坏趋势，从而提出防范措施以确保主梁的稳定性。本论文采用最新国际流行编程语言 R 实施。</p> <p><b>关键字：</b>主梁；剪力；弯矩；弯剪组合应力；地震效应</p> <p>The gate in the discharge structure is the main control measure of the discharge channel, which can control the flow rate of water, adjust the water level and discharge the sediment. In the case of heavy rainfall or earthquake, the safety assessment of the gate is particularly relevant to the direct or indirect economic loss downstream. The main gates of the gates play a key role in bearing the main load and provide support for the gates of the gates. The destruction of the main beam will directly lead to the destruction of the gate, so here as a research object.</p> <p>Firstly, the formulas for calculating the bending stress, shear stress and bending joint stress of the main girder of the radial gates are given for the two kinds of loads of hydrostatic pressure and hydrodynamic pressure. Secondly, according to the strength characteristics of the main beam, the failure mode of the main girder is analyzed, and the calculation formula of the safety factor of the three stress modes (bending stress, shear stress and bending joint stress) is given. Finally, these formulas are applied to the analysis of the radial gate of Danjiangkou Reservoir and Hubei Pubugou Reservoir, and the relationship between the head and the stress is drawn.</p> <p>The study is helpful to grasp the change trend of the water level - load effect of the main girders of the gates and judge the failure tendency of the main girder under static and dynamic load, so as to propose preventive measures to ensure the stability of the main girder. This paper adopts the latest international popular programming language R implementation.</p> <p><b>Key words:</b>Curved gates; main girder; shear; bending moment; bending joint stress; seismic</p>				

	effect			
2	土体强度的统计特性及边坡稳定性分析	2013484024	霍孟杰	
	<p>在岩土工程中，土体强度的特性直接关系到土工构筑物的稳定，不同地区的土体的物理和力学参数多样化，需要进行统计处理。进而判断土工构筑物的稳定性。本文主要对无限边坡稳定性进行分析，并且对附加地震作用的无限边坡和垂直边坡的稳定进行分析，本文使用的是确定性计算方法，给出边坡的某些特定的值，其中土体强度参数使用的源数据可通过 R 包“GeoRiskR”访问得到<a href="#">错误！未找到引用源。</a>，每个数据集均由土体的多个观测值组成。将其中的抗剪强度参数（粘聚力 <math>c</math> 和内摩擦角 <math>\phi</math>）作为变量，通过基于极限平衡分析得到的安全系数的公式进行无限边坡的稳定分析。从而观察土体强度参数对无限边坡稳定性的影响。本文的数据图均由 R 平台绘制，希望通过这些案例分析促进使用先进的 R 工具来解决一些土工问题。</p> <p><b>关键词：</b> 土体；无限边坡稳定；数据集；R</p> <p>In geotechnical engineering, the characteristics of soil strength are directly related to the stability of geotechnical structures, and the physical and mechanical parameters of soils in different areas are diversified and need to be statistically processed. And then determine the stability of geotechnical structures. In this paper, the stability of the infinite slope is analyzed, and the stability of the infinite slope and the vertical slope is analyzed. The deterministic calculation method is used to give some specific values of the slope. The source data used by the soil strength parameters can be accessed by the R package "GeoRiskR", each consisting of multiple observations of the soil. The shear strength parameters (cohesion <math>c</math> and internal friction angle <math>\phi</math>) are taken as variables, and the stability analysis of infinite slope is carried out by the formula of safety factor based on limit equilibrium analysis. So as to observe the influence of soil strength parameters on the stability of infinite slope. The data in this paper is drawn from the R platform, hoping to promote the use of advanced R tools to solve some of the geotechnical problems through these case studies.</p> <p><b>Key words:</b> soil; infinite slope stability; data set; R</p>			
3	不同场地中基桩相应荷载-沉降双曲线的离散性分析	2013484080	王瑞凯	优秀
	<p>基桩的竖向静载试验一直作为确定结构物设计承载力的可靠手段之一。由于受地层状况和土体空间变异性的影响，基桩在不同地质环境条件下的荷载-沉降曲线情况的差异性很大，即使地质环境相似但是基桩类型不同也会存在较大的差异。因此荷载-沉降离散性分析对于预测基桩的变化有非常重要的意义。本文结合在北京地区对 CFG 桩</p>			

单桩和 CFG 桩复合地基静态轴向压缩载荷下的 12 个现场足尺载荷试验数据集（由 6 个位置的 463 个样本组成），采用两参数的双曲线回归拟合每一条加荷-沉降曲线。由于土体的内在各向异性及其强度的变异性，评估整个场地的加荷-沉降双曲线时，其回归曲线表现出了较大的离散性。为此将一个场地分别在给定不同沉降量或不同给定荷载作用计算出相对应的值，对这些值进行密度分析，进而比较出荷载-沉降在各种情况下的离散性情况。本论文通过 R 语言对数据进行双曲线拟合进而进行荷载-沉降双曲线的离散性分析。该研究有助于对荷载-沉降双曲线的预测基桩的变化趋势，并为该地区的基桩的设计提供参考。

**关键字：**CFG 桩单桩；CFG 桩复合地基；荷载沉降；双曲线离散性；概率密度

The vertical static load test of the pile has been one of the reliable means to determine the bearing capacity of the pile foundation design. Due to the influence of stratigraphic conditions and spatial variability of soils, the scatter of load - sedimentation curves of pile can be caused by different geological conditions. The uncertainties are easily found even if the geological environment is similar and the type of pile is the same. Therefore, the analysis of load-deformation behavior is very important for predicting the bearing capacity of piles. In this paper, 12 full scale load test data sets (composed of 463 samples at 6 sites) under the static axial compressive load of CFG pile and CFG pile composite foundation in Beijing are employed, and two parameters of hyperbolic regression to each load - sedimentation curve are compiled. Due to the inherent anisotropy of the soil and the variability of its strength, the regression curve shows a large uncertainty when the loading-deformation at a specific site is evaluated. Consequently, for a specific site, the probability density distribution of deformation values under a given load is discussed; yet the probability density distribution of load values under a given deformation is presented. In this study, the source data are graphically analyzed by using the R language and then the scatter analysis of the load-settlement behavior is performed. This study is helpful to predict the evolution of the probability density distribution of load-deformation curves and to provide a guidance for the design of pile foundation.

**Key words:** CFG pile single pile; CFG pile composite foundation; load settlement; hyperbolic scatter; probability density function