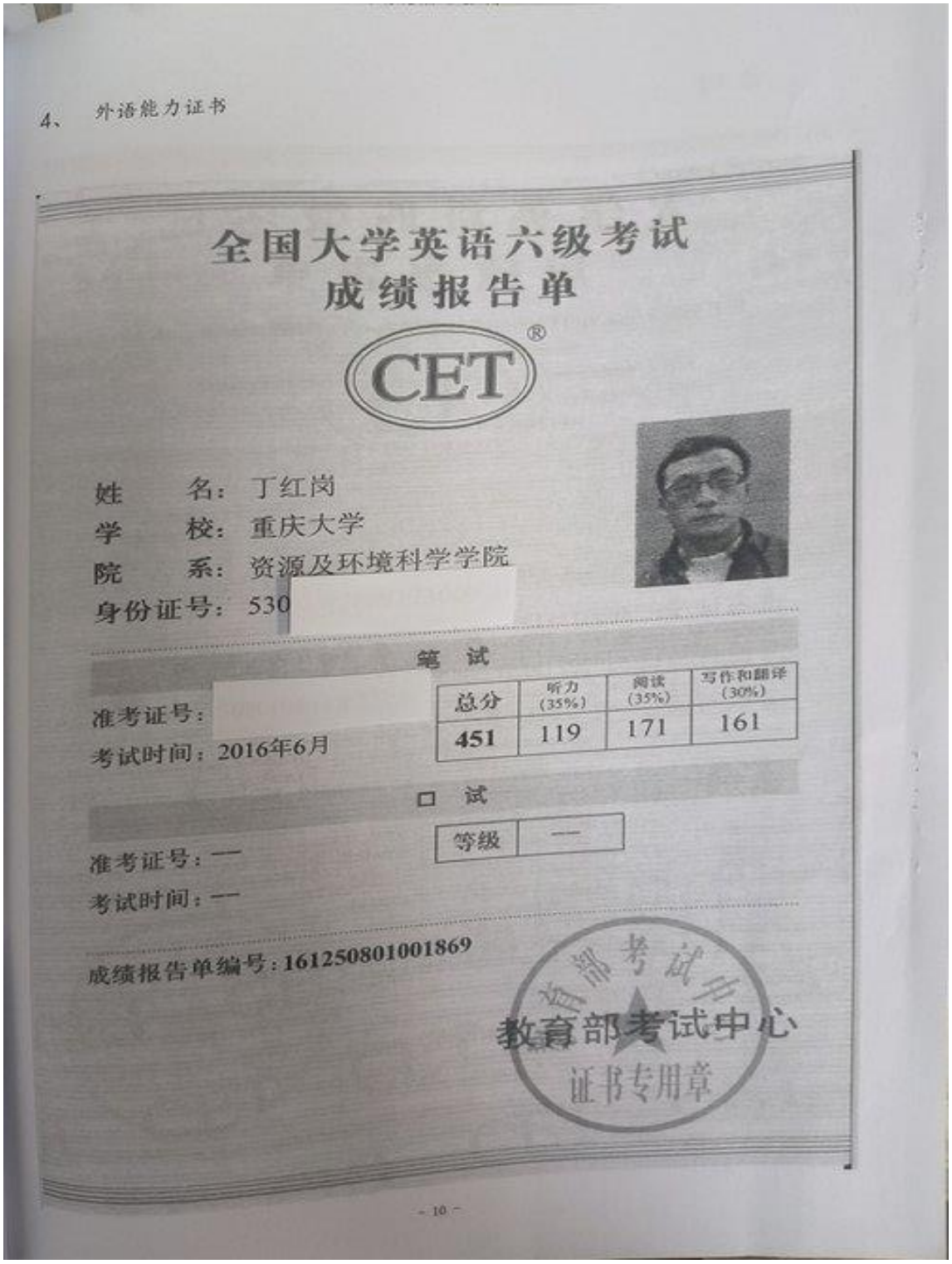
外语能力：



4、 外语能力证书

全国大学英语六级考试
成绩报告单

CET®

姓　　名：丁红岗
学　　校：重庆大学
院　　系：资源及环境科学学院
身份证号：530

笔　试

准考证号：
考试时间：2016年6月

总分	听力 (35%)	阅读 (35%)	写作和翻译 (30%)
451	119	171	161

口　试

准考证号：—
考试时间：—

等级	—

成绩报告单编号：161250801001869

教育部考试中心
证书专用章

- 10 -

学术能力：

Current Science
CS 5 (2), 1646-1654 (2025)
Received 15 Dec 2024 | Revised 20 Jan 2025 | Accepted 16 Feb. 2025 | Online Available 22 March 2025
https://doi.org/ 10.52845/CS/2025-5-2-28

OPEN ACCESS

ORIGINAL ARTICLE

Current Science
Current Science
ISSN(O)2795-8639

Study on the Mixing Properties of Bamboo Fiber and Loose Soil

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Abstract

Slope stability is crucial for geotechnical safety. This study evaluates bamboo fiber (BF) as a sustainable reinforcement for loose soils, analyzing the effects of BF content and clay proportion on shear strength. Direct shear tests showed that BF enhances cohesion (2.2-fold increase to 6.37 kPa) and the internal friction angle (48% improvement to 37.7°), with an optimal clay content of 16%. Synergistic interactions between BF and micro-clay particles were quantified via SEM, supporting a proposed micromechanical model for shear failure. These findings demonstrate BF's efficacy in slope stabilization, offering eco-friendly solutions for embankments and tailings dams.

Keywords: Bamboo fiber, Soil reinforcement, Shear strength

Introduction

The stability of slopes plays a crucial role in safeguarding life and property, particularly prominent in the construction of roadbeds, tunnels, and bridges [1]. In recent years, accelerated urbanization has elevated slope stability to a critical issue requiring urgent exploration and effective solutions in geotechnical engineering. Currently, there is considerable attention focused on the performance of geotechnical engineering materials, particularly in soil improvement techniques. The current methods for soil improvement primarily include physical, chemical, and biological approaches. Physical methods involve adding materials with certain strength to the soil to enhance its tensile and compressive properties [2]; chemical methods improve soil mechanical properties by adding chemical materials that react with the soil [3]; and biological methods utilize microorganisms to alter the physical and chemical properties of the soil, thereby enhancing its engineering performance [4].

In recent years, numerous scholars have employed physical, chemical, and biological methods to improve soil. In terms of physical methods, Arabani M mixed wheat fiber and nano-bentonite [5], palm fiber into the soil as experimental materials; Zachariah P.J. used sugarcane bagasse fiber as a reinforcing material for sandy gravel soil [6]; Qihong Y utilized plant roots as soil reinforcement material [7]; and Ramkrishnan R employed sisal fiber to strengthen soil [8]. These studies found varying degrees of improvement in soil's compressive and shear strength indicators. In chemical methods, Srijan added Portland cement and lime as chemical materials to soft soil, effectively improving soil strength [9]; Chen L.H. employed chemical grouting to reinforce the soil around bridge abutments, enhancing its compressive properties [10]; and Yuxin W used a chemical method involving urea-induced calcium carbonate precipitation for foundation repair and reinforcement [11]. In biological methods, Fatehi H added casein and sodium caseinate biopolymers extracted from milk to sandy soil to study their effects on the mechanical properties of the soil [12]; Haystead J and Surabhi J researched denitrifying microorganisms in soil reinforcement, primarily through their enzymes and metabolic activities to precipitate carbonate minerals [13].

Regarding slope loose soil reinforcement,

附件 2

项目编号：2023J1485
是否专项：否
专项名称：

云南省教育厅科学研究基金项目

任务合同书

V2023

项目名称：松散体边坡含水率与含黏量的耦合研究

项目单位：云南工商学院

负 责 人：丁红岗

联系电话：17806903397

签订日期：2023 年 3 月 1 日

云南省教育厅　　制表

一、基本情况

项目名称	松散体边坡含水率与含黏量的耦合研究				
项目类别	教师类		研究类别	应用研究	
学科名称	土木工程		学科代码	0814	
开始时间	2023年 3月 1日		结题（项）时间	2024年 3月 1日	
立项总经费	2万元		预期成果形式	论文、专利	
负责人	姓 名	丁红岗	性别	男	出生年月	1989年 12月 30日
	身份证号	530302198912300938			
	学 历	1	1. 研究生；2. 大学本科；3. 大专；4. 中专；5. 其他		
	职 称	2	1. 高级；2. 中级；3. 初级；4. 其它		
	电 话	17806903397	通讯地址	云南省昆明市嵩明县杨林职教园区云南工商学院	
第一承担单位	名 称	云南工商学院		邮编	651701
	地 址	云南省昆明市嵩明县杨林职教园区云南工商学院		电话	
	联系人	李颖	电话	13283817789	
其它主要参加单位	序号	单位名称		参与形式	
	1			□合作 □协作	
	2			□合作 □协作	
	3			□合作 □协作	

所在单位科研管理部门意见

同意资助2.0万元，步格按照合同约定完成各项研究任务，按时保质完成课题。

（盖章）
2023年2月2日

云南省教育厅科技处意见

同意立项，请严格按研究目标、进度计划组织实施。

（盖章）
年 月 日