



Research on Standardized Design of Assembled Pile-slab Road Structures

Ke Hu, Yu Zhu

Anhui Transportation Holding Group Co., Ltd., Hefei, China, 230088.

Zhiquan Liu

Tongji University, Shanghai, China, 200092.

Yuan Fang

Anhui transportation planning, design and Research Institute Co., Ltd, Hefei, China, 230088.

Contact: liuzhiquan2005@126.com

Abstract

The assembled pile-slab road structure is a frame structure system composed of factory prefabricated plate girders and pipe piles, which has the advantages of fast construction, small footprint, and low environmental impact compared with the traditional earth roadbed. In order to develop a series of pile-slab road structures that can replace high-fill roadbeds, this paper studies the reasonable forms of pile-slab road structures suitable for replacing earth roadbeds in response to the needs of highway reconstruction and expansion and new construction. The reasonable form of pile-slab road structure travel lane plate is systematically analysed, and the reasonable upper and lower structure forms of pile-slab road structure are proposed. And for the need of assembly construction, the division method of the prefabricated sections of members is studied, and a series structure system of 6m~12m is established, which is suitable for application in road construction projects with tight land resources and has good comprehensive benefits. Finally, a standardized design method for pile-slab road structures is developed, which can provide guidance for the application of such assembled pile-slab road structures.

Keywords: Pile-slab road; structural form; standardization; design.

1 Introduction

Due to the shortage of land resources and the emphasis on environmental issues, the construction of highways is facing a huge challenge now. In order to deal with these problems, pile-slab subgrade structures have been proposed and applied highway construction, which solves the contradic-

tion between highway traffic development and land resource protection with the structural system of road and bridge integration and realize sustainable highway construction. As a new type of prefabricated structure, the pile-slab structure has great application potential in the field of highway construction in the future with strong