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58-16

Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways

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AMERICAN SOCIETY OF CIVIL ENGINEERS

T&DI
TRANSPORTATION & DEVELOPMENT INSTITUTE

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PREFACE

Interlocking concrete pavers can provide a durable and effective pavement system, but as with any pavement, proper design, construction, and maintenance procedures are required. This standard guideline has been prepared by the ASCE/T&DI Structural Design of Interlocking Concrete Pavement Standards Committee. It establishes guidelines for developing appropriate pavement structures for various traffic and subgrade conditions. The overall goal of this standard guideline is to assist the industry and public by establishing structural design standards for interlocking concrete pavements.

The trend in North America is toward the development and implementation of mechanistic-empirical design protocols. Although efforts by the interlocking concrete pavement industry to move toward adopting a mechanistic-empirical design procedure are underway, the required data to implement such a procedure are not yet available, and therefore, this standard guideline was developed according to the 1993 AASHTO *Guide for Design of Pavement Structures* (AASHTO 1993).

The development of this standard guideline is a result of a partnership between the Transportation and Development Institute of ASCE and the Interlocking Concrete Pavement Institute. The organizations jointly encouraged expert volunteers to become a part of the standards committee that developed the standard guideline and supported the efforts of that committee. This committee comprises individuals from many backgrounds, including consulting engineering, research, design and manufacturing, education, government, and private practice.

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CHAPTER 1
GENERAL

1.1 SCOPE

The provisions of this standard guideline establish the procedures for the structural design of interlocking concrete pavements. This standard has been developed to provide structural design guidance for municipal streets and roadways. This standard applies to paved areas subject to applicable permitted axle loads and trafficked up to 10 million 80-kN (18,000-lb) equivalent single axle loads (ESALs). A minimum 80-mm (3.125-in.) thick paver is used in the standard guideline as this is the minimum thickness recommended for municipal roadways. This standard guideline applies to roadways with a design speed of up to 70 km/h (45 mi/h). Many of the design considerations herein require a working knowledge of soil mechanics, traffic loading, and pavement materials. Such knowledge is necessary for the application of this standard guideline.

This standard guideline applies only to the design of new pavement structures surfaced with interlocking concrete pavers. The standard guideline includes structural design guidelines for untreated, asphalt-treated, and cement-treated bases. Asphalt concrete (hot-mix asphalt) bases are considered on a limited basis for high traffic, low subgrade strength conditions as a means to reduce the overall thickness of the pavement.

The standard guideline does not include provisions for inclusion of interlocking concrete pavers on a Portland cement concrete (PCC) base. This standard guideline does not address aspects such as project-specific details, specifications, construction, and maintenance practices that are critical to the successful performance of the pavement. Other references should be consulted for the design of these pavement systems.

1.2 REFERENCED STANDARDS

In addition to provincial, state, and local pavement design procedures and guidelines having jurisdiction, the provisions of this standard guideline's references should be considered when they apply and when they are noted.

1.3 DEVIATIONS FROM THIS STANDARD GUIDELINE

Use of proprietary, new, and/or improved interlocking concrete pavement, materials, evaluation techniques, and installation methods are not prohibited, as long as the design and installation of the pavement are shown to comply with or exceed these standard guidelines.

1.4 ENGINEER REQUIRED

Work covered by this standard guideline should be carried out under the guidance of a professional engineer with a background in the design of pavement systems. The professional engineer is hereinafter referred to as the engineer.