AASHTO GUIDE SPECIFICATIONS THERMAL EFFECTS IN CONCRETE BRIDGE SUPERSTRUCTURES

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Abridged Version of NCHRP Report 276
Thermal Effects in Concrete Bridge Superstructures

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PREFACE

This document contains design guidelines for thermal effects in highway concrete bridge superstructures, and is an abridged version of "National Cooperative Highway Research Program Report 276, Thermal Effects in Concrete Bridge Superstructures." The NCHRP research project was initiated due to a few cases of distress in concrete bridges caused by thermal gradient stresses. It is noted in the report that foreign codes give much more significance to the effect of thermal gradient stresses than the AASHTO *Standard Specifications for Highway Bridges,* and a simplified method of analogy is recommended in Appendix A. The report, in Chapter Six, recognizes that the effect of temperature differentials in bridge superstructures have not been clearly established. The stresses that would be theoretically developed in a bridge by observed temperature gradients are inconsistent with observed performance of the bridges in many cases. This is the primary reason why a guide specification is recommended rather than a modification of the AASHTO design specifications. Field measurements of differential temperatures and thermal stresses through the sections of prestressed concrete box girder bridges clearly indicate significant differences that should be recognized and addressed by the designer of such structures.

Appendix A, B, C, and Chapter Three of NCHRP Report 276 were reformatted with minor changes to form the recommended "AASHTO Guide Specifications, Thermal Effects in Concrete Bridge Superstructures." This document is recommended for use to the bridge design community by the AASHTO Subcommittee on Bridges and Structures for this purpose. Copies of NCHRP Report 276, "Thermal Effects in Concrete Bridge Superstructures" should be obtained from Transportation Research Board, National Research Council, Washington, D.C. A table of contents from NCHRP Report 276 is included in this report.