Designation: D4071 – 84 (Reapproved 2005)

Standard Practice for Use of Portland Cement Concrete Bridge Deck Water Barrier Membrane Systems[1]

This standard is issued under the fixed designation D4071; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers liquid applied, preformed, or built-up water barrier membrane systems and their application; overlaid with bituminous concrete wearing courses, for use in the protection of bridge decks from deleterious effects of deicing salts. Material use and specifications should be adapted to conform to job and user requirements for new construction or existing structures. This practice is written as a guide for the use of bridge deck water barrier systems only.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in Section 10.

2. Referenced Documents

2.1 *ASTM Standards:*[2] [3]

D3743 Terminology Relating to Bridge Deck and Substructure Protection[4]

2.2 *Other Documents:*

NCHRP Synthesis Report 57 Durability of Concrete Bridge Decks[5]

3. Terminology

3.1 For definitions of terms used in this practice, refer to Terminology D3743.

4. Significance and Use

4.1 This practice provides a guide for factors to be considered prior to waterproofing bridge decks with water barrier membrane systems. It will provide guidance for specification of materials, application of membrane systems, and placement of bituminous wearing courses. It may be used as a guide for new construction or for rehabilitation of existing structures.

5. Bridge Design and Specification Consideration

5.1 Proper use of water barrier membranes with bituminous concrete wearing courses requires consideration of certain elements during the design stage of new or existing bridges to be treated and covered with a bituminous concrete wearing course.

5.2 New bridge deck designs must include provision for dead loads including future systems.

5.3 The deck surface finish should be specified to allow proper use of the intended membrane system. Manufacturers' recommendations for surface finish should be reviewed for guidance on finishing freshly placed concrete or for repair of existing deck surfaces.

5.4 Surface drains should be designed to allow positive drainage to minimize the penetration of water through the bituminous wearing course.

5.5 Joint systems should be designed to provide adequate termination points for the membrane. Membranes should not be placed over expansion joints. Dams or expansion assemblies should be provided to the height of the bituminous wearing course.

5.6 Curbs or parapets, or both, should be designed for functional terminations. Manufacturers of membrane systems should be consulted for recommended termination details. If rough surfaces (such as granite curbs) are specified, a treatment should be specified to provide the surface smoothness required for the proper use of the membrane. Treatment of rough curbs may be achieved with a leveling surface treatment with epoxy mortar or other suitable materials.

5.7 Decks should include weepholes to provide drainage for water which penetrates through the bituminous wearing course to the membrane level.

[1] This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.32 on Bridges and Structures.

Current edition approved June 1, 2005. Published June 2005. DOI: 10.1520/D4071-84R05.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Withdrawn.

[4] Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

[5] Available from the National Cooperative Highway Reseacrh Program (NCHRP), Keck Center of the National Academies Transportation Research Board, 500 Fifth Street, NW Washington, DC 20001.