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Standard Terminology Relating to Pavement Distress¹

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1. Scope

1.1 This terminology provides definitions for pavement distress for airfields, highways, roads, streets, and parking lots of all functional classifications.

1.2 This terminology covers surfaces paved with either bituminous or portland cement concrete. It does not include other paved or unpaved surfaces.

1.3 This terminology includes most of the significant types of pavement surface distresses, but it is not all inclusive.

1.4 Not all distresses noted are applicable to all pavement categories listed in 1.1.

1.5 Severity levels are not addressed in this terminology but are addressed in other ASTM test methods and practices (for example, Test Method D5340). However, a knowledge of severity levels is required for evaluating many of the distresses defined in this terminology.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D5340 Test Method for Airport Pavement Condition Index Surveys

3. Terminology

GENERAL

bituminous pavement, *n*—a pavement comprising an upper layer or layers of aggregate mixed with a bituminous binder,

¹ This terminology is under the jurisdiction of ASTM Committee E17 on Vehicle - Pavement Systems and is the direct responsibility of Subcommittee E17.42 on Pavement Management and Data Needs.

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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.

such as asphalt, coal tars, and natural tars for purposes of this terminology; surface treatments such as chip seals, slurry seals, sand seals, and cape seals are also included.

continuously reinforced concrete pavement (CRCP), *n*—portland cement concrete pavement with sufficient longitudinal steel reinforcement to control transverse crack spacings and openings in lieu of transverse contraction joints for accommodating concrete volume changes and load transfer.

crack, *n*—fissure or discontinuity of the pavement surface not necessarily extending through the entire thickness of the pavement.

depression, *n*—localized pavement surface areas at a lower elevation than the adjacent paved areas.

free edge, *n*—an unrestrained pavement boundary.

joint, *n*—a discontinuity made necessary by design or by interruption of a paving operation.

joint seal deterioration, *n*—any condition which enables incompressible materials or water to infiltrate into a previously sealed joint from the surface.

DISCUSSION—Ability to prevent water infiltration is an attribute that cannot always be readily determined visually.

jointed concrete pavement (JCP), *n*—portland cement concrete pavement that has transverse joints placed at planned intervals.

lane-to-shoulder dropoff, *n*—(*highways, roads and streets only*) difference in elevation between the traveled surface and the shoulder surface.

longitudinal cracking, *n*—cracks in the pavement predominantly parallel to the direction of traffic.

pavement distress, *n*—external indications of pavement defects or deterioration.

portland cement concrete pavement, *n*—a pavement having a surface of aggregate mixed with portland cement paste binder or a mixture of portland cement and other pozzolans.

pumping, *n*—ejection of liquid or solid material or both from beneath the pavement through a crack or joint.

shoving, *n*—the horizontal displacement of a localized area of the pavement surface which may also include some vertical displacement.

DISCUSSION—Generally associated with turning, braking or accelerating vehicles. Can also be due to concrete expansion against adjacent bituminous pavement.

slippage cracking, *n*—cracking associated with the horizontal displacement of a localized area of the pavement surface.

swell, *n*—a hump in the pavement surface that may occur over a small area or as a longer, gradual wave; either type of swell can be accompanied by surface cracking.

transverse cracking, *n*—cracks in the pavement that are predominantly perpendicular to the direction of traffic.

BITUMINOUS PAVEMENT DISTRESSES

alligator (crocodile) cracking, *n*—interconnected or interlaced cracks forming a pattern which resembles an alligator's hide.

bituminous bleeding, *n*—excess bitumen on the surface of the pavement, usually found in the wheel paths.

block cracking, *n*—a pattern of cracks that divide the pavement into approximately rectangular pieces, ranging in size from approximately 0.1 m² to 1.0 m² (1 ft² to 100 ft²).

corrugation, *n*—transverse undulations at regular intervals in the surface of the pavement consisting of alternate valleys and crests not more than 1 m (3 ft) apart.

edge cracking, *n*—crescent-shaped cracks or fairly continuous cracks that are located within 0.6 m (2 ft) of the pavement edge.

jet-blast erosion, *n*—(*airfields only*) darkened areas on the pavement surface where bituminous binder has been burned or carbonized; localized burned areas may vary in depth up to approximately 15 mm (½ in.).

oil spillage, *n*—a localized deterioration or softening of the pavement surface caused by the spilling of oil, fuel, or other solvents.

polished aggregate, *n*—exposed aggregate worn sufficiently smooth to affect frictional characteristics.

potholes, *n*—bowl-shaped holes in the pavement surface, greater than 0.1 m (4 in.) in diameter, and more than 25 mm (1 in.) in depth.

raveling, *n*—loss of pavement surface material involving the dislodging of aggregate particles and degradation of the bituminous binder.

reflection cracking at joints, *n*—cracks in bituminous overlay surfaces that occur over concrete pavements at joints.

rut, *n*—a contiguous longitudinal depression deviating from a surface plane defined by transverse cross slope and longitudinal profile.

PORTLAND CEMENT CONCRETE PAVEMENT SURFACE DISTRESSES

blowups, *n*—localized upward movement of the pavement surface at transverse joints or cracks, often accompanied with shattering of the concrete in that area.

corner breaks, *n*—(*JCP only*) a portion of the slab separated by a crack that intersects the adjacent transverse and longitudinal joints, describing approximately a 45 degree angle with the direction of traffic where the length of the sides is from 0.3 m (1 ft) to one half the width of the slab.

durability “D” cracking, *n*—closely spaced crescent-shaped hairline cracking pattern that initiates adjacent to joints, cracks, or free edges, first manifesting itself at the intersection of joints, cracks or free edges; dark coloring of the cracking pattern and surrounding area often exists with “D” cracking.

faulting of joints and cracks, *n*—difference in elevation across a joint or crack.

joint spalling, *n*—cracking, breaking, or chipping of concrete pavement edges within 0.6 m (2 ft) of a joint.

lane-to-shoulder separation, *n*—(*highways, roads and streets only*) widening of the joint between the edge of the slab and the shoulder.

map cracking, *n*—a series of interconnected cracks that extend only into the upper portion of the slab.

patch, *n*—a portion of pavement surface which has been replaced or where additional material has been applied to the pavement after original construction.

popouts, *n*—small holes in the pavement surface, normally ranging in diameter from 25 mm (1 in.) to 100 mm (4 in.) and depth from 13 mm (0.5 in.) to 50 mm (2 in.).

pumping, *n*—ejection of water, material, or both from beneath the pavement through a crack or joint.

DISCUSSION—The mechanism for ejection is not necessarily limited to traffic loading.

punchouts, *n*—a broken area of a concrete slab bounded by closely spaced cracks (usually less than 1 m (3 ft)).

scaling, *n*—the deterioration of the upper concrete slab surface, normally 3 mm (0.125 in.) to 13 mm (0.5 in.) in depth, resulting in the loss of surface mortar.

transverse construction joint deterioration, *n*—(*CRCP only*) series of closely spaced transverse cracks or a large number of interconnecting cracks occurring near a construction joint.

4. Significance and Use

4.1 This terminology provides a reference for defining pavement distress types regardless of the ultimate intended use for the data or the amount, or both, of pavement to be surveyed.

4.2 This terminology may be used with both manual and automated distress surveys. The terminology will allow equipment manufacturers to develop automated methodologies that will help address the needs of agencies and field personnel.