

No. NH VI-50 (15)/78

*Dated the 14th August, 1978***MEMORANDUM****Subject : Standard Terminology for Bituminous Pavement Distress Modes**

Pavement condition survey is a useful tool in maintenance management and in working out the strategy for strengthening the pavement. This usually consists of a visual survey for the pavement distress or objective measurements for strength/riding quality, or a combination of both.

2. When a visual survey is made, either during the inspection of an officer or specifically for maintenance/strengthening purposes it is necessary to record the distress manifestations of the pavement for objective evaluation etc. in the design office. For the individual bias not to enter into the recording of the distress, it would be desirable to use clearly understood and proper terms for the different distress types. A standardised terminology has therefore been attempted and is given in the Annexure for use of the Technical Officers. The Annexure in addition gives the likely causes and a few illustrations.

3. For detailed information about pavement distress etc. the following books may be consulted :

- (i) "Principles of Pavement Design" by E.J. Yoder and M.W. Witczak — Chapter on pavement distress.

(ii) "Soil Mechanics for Road Engineers" published by Her Majesty's Stationery Office.

To

1. All Technical Officers in the Roads Directorate at Headquarters.
2. ROs/ELOs.

*Enclosure to letter No. NHVI-50 (15)/78 dt. 14.8.78*

**ANNEXURE**

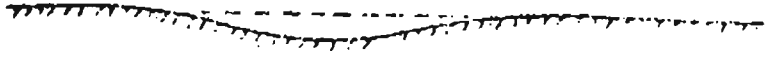


### DISTRESS ON BITUMINOUS PAVEMENTS

Sl. No.	Distress type	Distress manifestation	Cause/distress mechanism
1.	2.	3.	4.
1.	Weathering	Surface appearing dry and bitumen seems oxidised.	Too old a surfacing, use of less bitumen.
2.	Bleeding	Surface appearing rich in bitumen; free bitumen on surface particularly in wheel paths.	Too much bitumen in mix, use of too soft a bitumen.
3.	Rutting	Depression in the wheel paths without upheaval in the adjacent area.	Densification, consolidation.
4.	Shear failure in subgrade	Depression in the wheel path accompanied by upheaval at some distance from the depression.	Shear failure due to excessive loading poor shear strength of subgrade.
	(b) in pavement	—Do— but upheaval relatively close to the depression.	—Do— poor shear strength of pavement materials.
5.	Cracking		
	(a) Longitudinal cracks.	Single or multiple cracks in the longitudinal direction.	Differential settlement of fill, lack of internal friction of base.
	(b) Alligator cracks Class I	Cracks in more than one direction joined with each other to form a map pattern. Crack edges are not raised or spalled and there is no rocking under the load.	Fatigue of surface. Excessive resilience of sub grade
	(c) Alligator cracks, Class 2	Same as above but of more in tensive nature. Edges of cracks raised or spalled and the pieces rock under wheel loads.	Pavement in serious distress. Excessive movement of underlying layers. Pavement structurally inadequate.
	(d) Reflection cracks	Reflection of cracks from semirigid or rigid base. Generally regular in occurrence.	Reflection of cracks from underlying layer.
6.	Potholes		
	(a) Isolated pot holes	Potholes at isolated location not associated with other failure modes.	Local distress, local soft spots, local locking up of water.
	(b) Potholes associated with cracking	Potholes associated with alligator cracks. Cracked pieces getting removed under traffic.	Pavement in severe distress, at its last phase of life. Structurally inadequate.
7.	Edge breaking	Pavement edges getting broken	Lack of shoulder support, tracking at pavement edges.
8.	Ravelling	Aggregates, both coarse and fine getting out of the pavement and getting collected in areas other than wheel paths.	Stripping, abrasion by traffic, degradation of aggregates, insufficient bitumen, bitumen oxidised.

**Notes :** (a) For detailed information the following books may be consulted :

- (i) "Principles of Pavement Design" by E.J. Yoder and M.W. Witczak — Chapter on pavement distress.
- (ii) "Soil Mechanics for Road Engineers" published by Her Majesty's Stationery Office.
- (b) A few illustrations of pavement distress are given in the drawing attached.

## ILLUSTRATIONS OF PAVEMENT DISTRESS

<p><b>RUTTING</b></p>	
<p><b>SHEAR FAILURE IN SUBGRADE</b></p>	
<p><b>SHEAR FAILURE IN PAVEMENT</b></p>	
<p><b>CRACKING AND POT HOLES</b></p>	<div style="margin-bottom: 20px;"> <p><b>A. ALLIGATOR CRACKING</b></p> <p><b>E. EDGE BREAKING</b></p> <p><b>L. LONGITUDINAL CRACK</b></p> <p><b>P<sub>1</sub> ISOLATED POT HOLE</b></p> <p><b>P<sub>2</sub> POT HOLE ASSOCIATED WITH CRACKING</b></p> </div> 