Transport and Main Roads

Technical Note EN07

Conformance of Polymer Modified Binders

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1   PURPOSE

The purpose of this Engineering Note is to provide provisional guidance to Administrators on determining an appropriate deduction value for deliveries of non-conforming polymer modified binders, where the Administrator accepts the works for reduced level of service.

2   APPLICABILITY

This note applies to all polymer modified binders supplied to Department of Transport and Main Roads roadworks projects. The quality of bituminous binders delivered to job sites is covered by Standard Specifications *MRTS 17 Bitumen* and *MRTS 18 Polymer Modified Binders*. Clause 10.4 of MRTS 17 deals with non-conforming bitumen binders where defects are calculated via a schedule within Table 7 of that document. However, Clause 11.3 of MRTS 18 dealing with this parallel matter for polymer modified binders states that "determination of an appropriate reduced level (of service) shall be as determined by the Superintendent".

This note shall not apply prior to January 2011.

3   INFORMATION

The underpinning principle in determining a fair value for non-conforming polymer modified binders is that the tested properties are evaluated within a sliding linear scale between such properties for a conforming polymer modified binder of the particular class and for conventional bitumen (C170 for sealing classes, C320 for asphalt classes), and adjusted according to the price differential between the polymer modified binder and conventional bitumen. The base property value for a conforming modified binder delivered to a job site does not correspond to the minimum specified for the as-manufactured class within MRTS 18, but includes allowances for testing repeatability and for some property deterioration during storage/transport as determined from a Departmental study of field sample properties.

Evaluated properties are softening point and torsional recovery at 25°C, with equal weighting shared between these properties when relevant.

4   DEDUCTION CALCULATIONS

The following calculation shall be used in calculating the suggested deduction:

D = F * ΔP

Where:

D = Suggested deduction in dollars per tonne ($/t)

F = Deduction Factor (refer Table 1)

And in Table 1:

SP = Test value for softening point (°C)

TR25 = Test value for torsional recovery at 25°C (%)

ΔP = PP-PB

PP = Job price for polymer modified binder ($/t)

PB = Departmental price for conventional bitumen ($/t)

Note that F and ΔP may vary according to the criteria or the price selected.

Table 1: Deduction factor selection

Class	Criteria	Deduction Factor (F)
A0.6S	When SP < 59 and TR25 < 25	4.16574 - 0.06098SP - 0.02273 TR25
	When SP < 59 and TR25 ≥ 25	3.59756 - 0.06098SP
	When SP ≥ 59 and TR25 < 25	0.56818 - 0.02273 TR25
A5S	When SP < 76 and TR25 < 45	2.04365 - 0.01984 SP - 0.01190 TR25
	When SP < 76 and TR25 ≥ 45	1.50794 - 0.01984 SP
	When SP ≥ 76 and TR25 < 45	0.53571 - 0.01190 TR25
A10S	When SP < 81 and TR25 < 49	1.87367 - 0.01656 SP – 0.01087 TR25
	When SP < 81 and TR25 ≥ 49	1.34106 - 0.01656 SP
	When SP ≥ 81 and TR25 < 49	0.53261 - 0.01087 TR25
A0.6B	When TR25 < 16	1.23077 - 0.07692 TR25
A2V	When SP < 62 and TR25 < 6	3.76786 - 0.04464 SP - 0.16667 TR25
	When SP < 62 and TR25 ≥ 6	2.76786 - 0.04464 SP
	When SP ≥ 62 and TR25 < 6	1.00000 - 0.16667 TR25
S0.25S	When TR25 < 14	1.21739 - 0.08696 TR25
S0.7S	When SP < 52 and TR25 < 20	6.76191 - 0.11905 SP - 0.02857 TR25
	When SP < 52 and TR25 ≥ 20	6.19058 - 0.11905 SP
	When SP ≥ 52 and TR25 < 20	0.57143 - 0.02857 TR25
S4.5S	When SP < 75 and TR25 < 44	1.90880 - 0.01838 SP - 0.01205 TR25
	When SP < 75 and TR25 ≥ 44	1.37868 - 0.01838 SP
	When SP ≥ 75 and TR25 < 44	0.53012 - 0.01205 TR25
S0.3B	When TR25 < 15	1.20000 - 0.08000 TR25
S1.8R	When SP < 53 and TR25 < 23	5.65171 - 0.09615 SP - 0.02222 TR25
	When SP < 53 and TR25 ≥ 23	5.09615 - 0.09615 SP
	When SP ≥ 53 and TR25 < 23	0.55556 - 0.02222 TR25
S15RF	When SP < 55 and TR25 < 25	4.37500 - 0.06944 SP - 0.02222 TR25
	When SP < 55 and TR25 ≥ 25	3.81944 - 0.06944 SP
	When SP ≥ 55 and TR25 < 25	0.55556 - 0.02222 TR25
S18RF	When SP < 62 and TR25 < 30	2.72855 - 0.03521 SP - 0.01818 TR25
	When SP < 62 and TR25 ≥ 30	2.18310 - 0.03521 SP
	When SP ≥ 62 and TR25 < 30	0.54545 - 0.01818 TR25

5   CONSULTATION

Representatives from local authorities, consultants, and Main Roads districts were consulted about this issue. These individuals had either voiced their concern about RPC/MWPC issues at departmental or Roads Alliance forums, or had shown previous interest in taking action to resolve their particular problems. AAPA Strategic Alliance was consulted.