

Analysis of the Quality Standards for Microsurfacing Treatments

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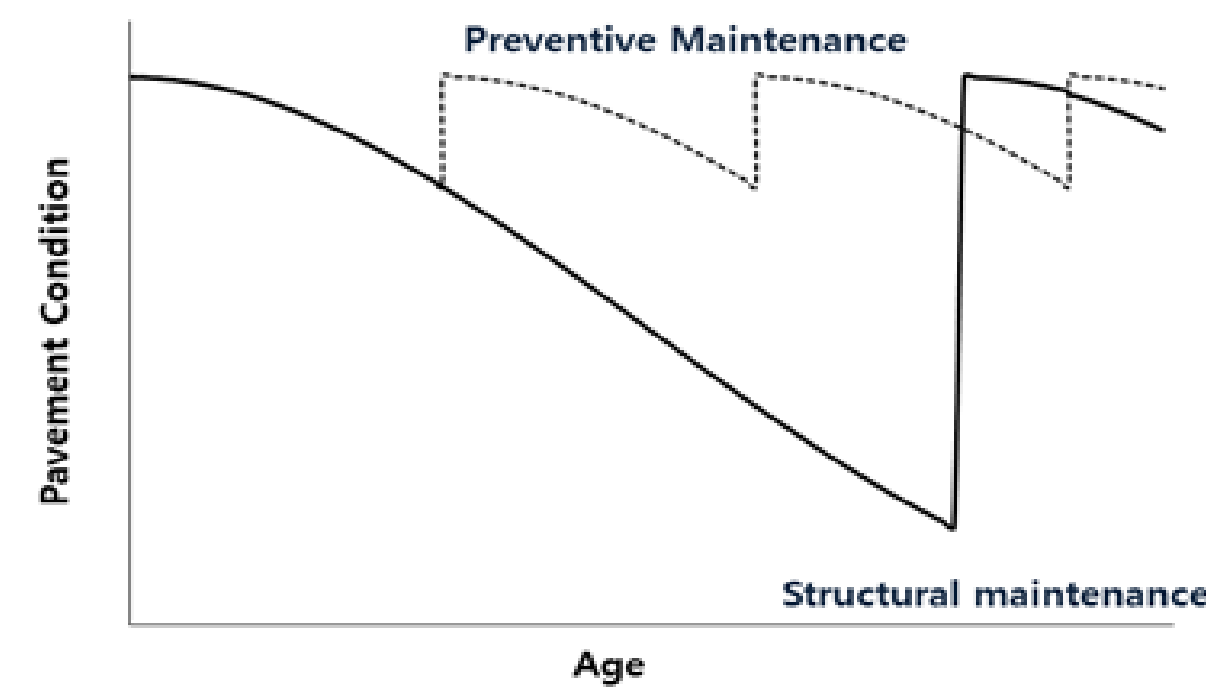
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1. Introduction

- Internationally pavement preservation treatments are used for various reasons with the focus being on extending the pavement life at a low budget
- Generally, pavement maintenance was performed after the pavement show major deterioration
- However, that is more costly, allows the pavement to lose even more its structural capability
- Therefore the concept of pavement maintenance was introduced because it allows the pavement to be treated before it loses its structural capability
- Among the preventive maintenance, microsurfacing is one of the most used pavement treatment around the world
- Therefore, this study evaluates materials and mixtures used for microsurfacing in South Korea as well as evaluating the in-situ surface condition before and after the placement of a microsurfacing treatment



2. Test Materials and Experiment Method

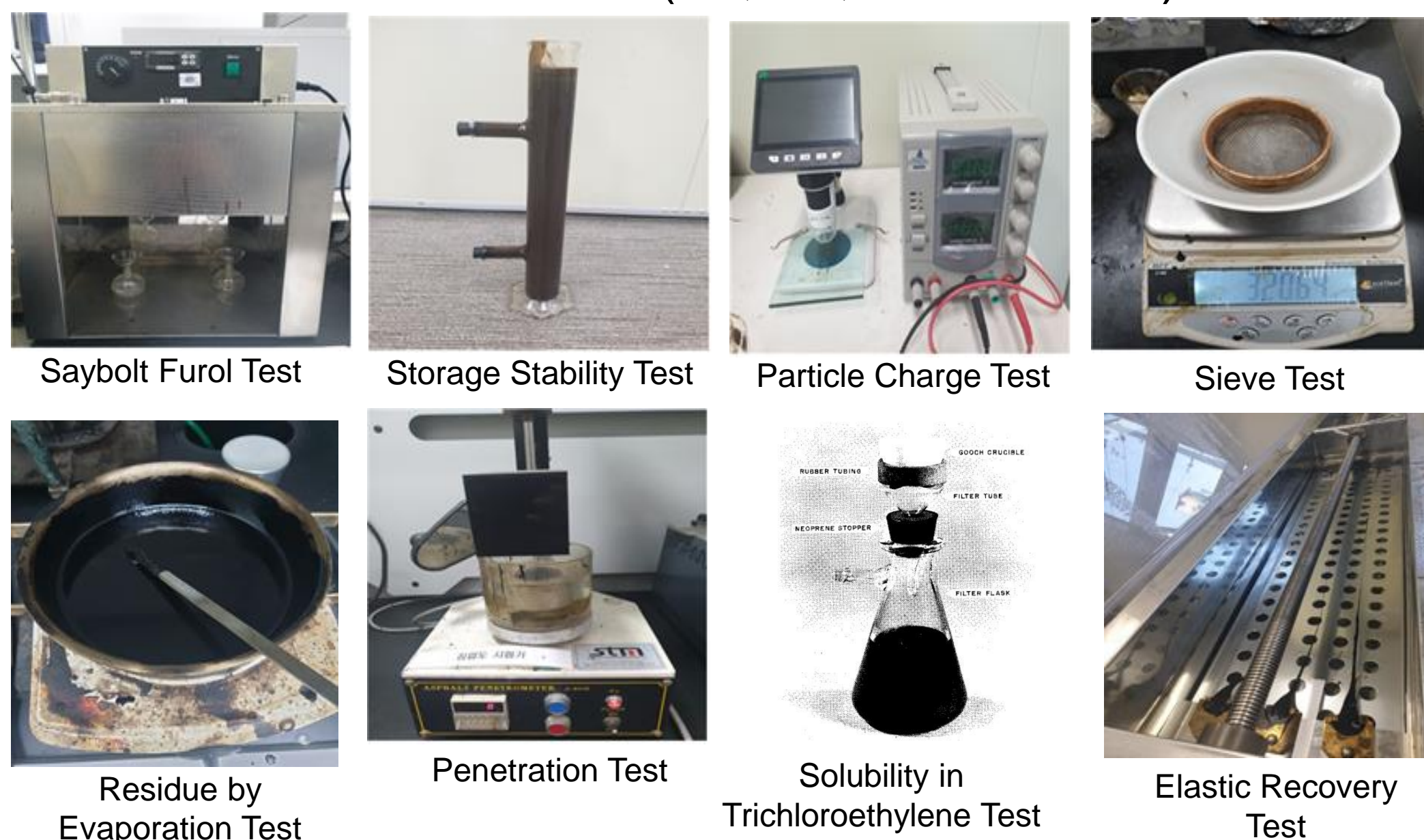
- Material evaluation happened in two stages:
Lab material: Materials received weeks before construction
Field material: Materials received from the field

1. Aggregate

- The maximum particle size in the aggregates range from 0~5mm
- Aggregate sieve test was performed in accordance with KS F2502 by using a 500g aggregate sample

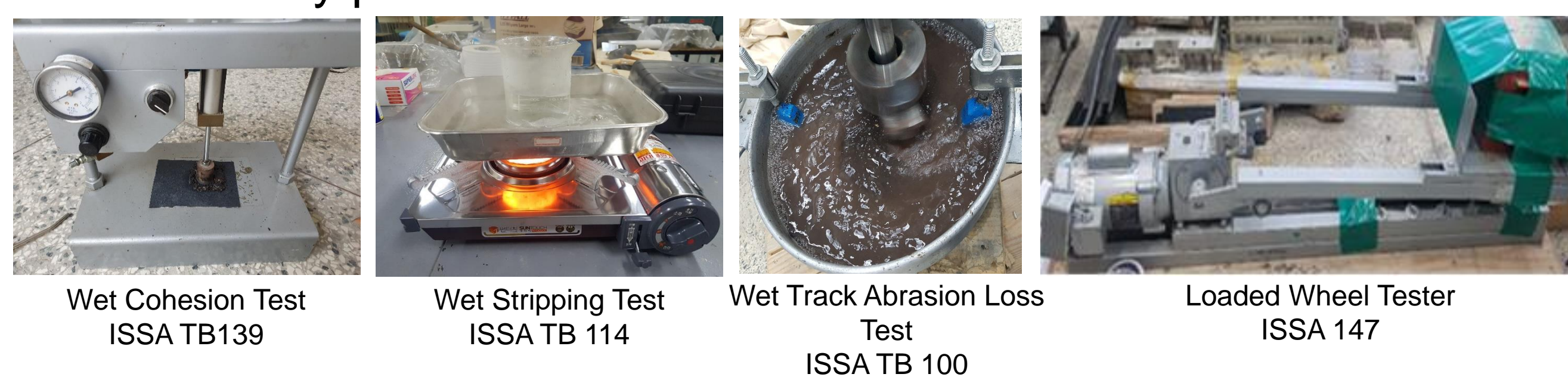
2. Asphalt Emulsion

- Emulsion properties such as saybolt furol, sieve test, storage stability, particle charge, residue by evaporation, penetration, solubility in trichloroethylene and elastic recovery were tested in accordance with AASHTO T (59, 49, 44 and 301)



3. Mixture

- ISSA and AASHTO recommend tests such wet cohesion, wet-track abrasion, wet stripping, and loaded wheel to evaluate the quality of a laboratory produced mixture



4. Surface Condition

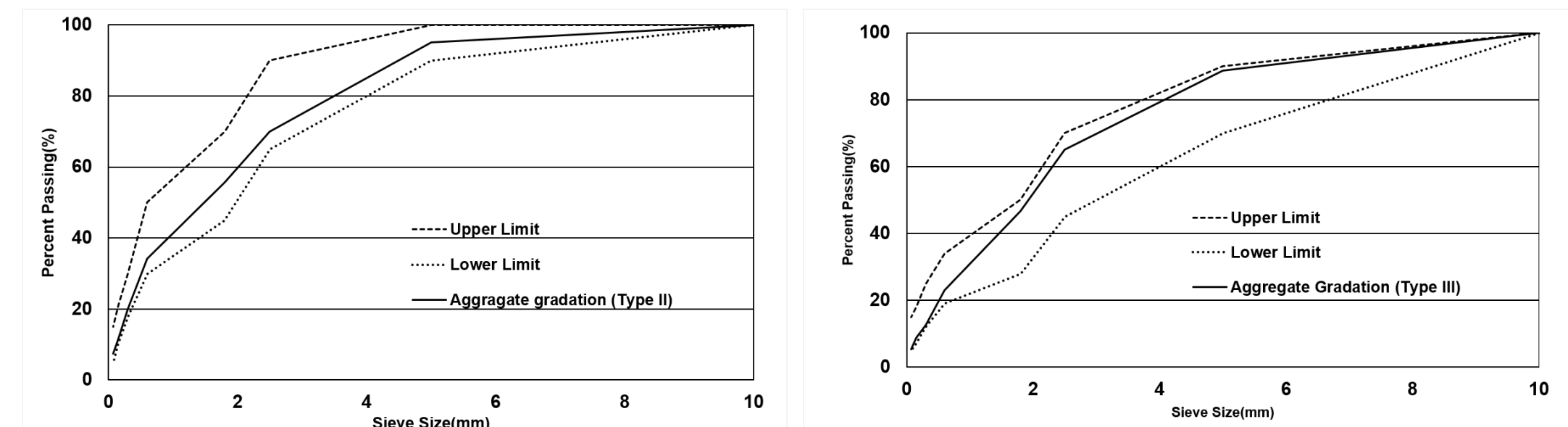
- Pavement condition was evaluated considering the distresses to be addressed. Tests to access the pavement texture, the crack rates, rutting depth and the roughness were performed by a Korean agency



3. Test Results

1. Aggregate

- Tested aggregates were identified as type II and type II
- Type II - AADT is (500~5000), Type III – AADT (more than 5000)



2. Asphalt emulsion

- Apart from the saybolt furol viscosity, all the other properties did satisfy the recommended standards specifications by ISSA

Properties	Criteria	Lab Material	Field Material
Saybolt Furol Viscosity 25°C, s	20~100	124 [NG]	134 [NG]
Sieve test, %	~0.1	0.02 [OK]	0.03 [OK]
Storage Stability 1 day, %	~1	0.7 [OK]	0.6 [OK]
Particle charge	Positive	Positive [OK]	Positive [OK]
Residue by evaporation, %	62~	65 [OK]	63 [OK]
Penetration 25°C, 0.1mm	40~90	71 [OK]	68 [OK]
Solubility in trichloroethylene, %	97.5~	99.2 [OK]	98.9 [OK]
Elastic Recovery 25°C, %	40~	100~ [OK]	100~ [OK]

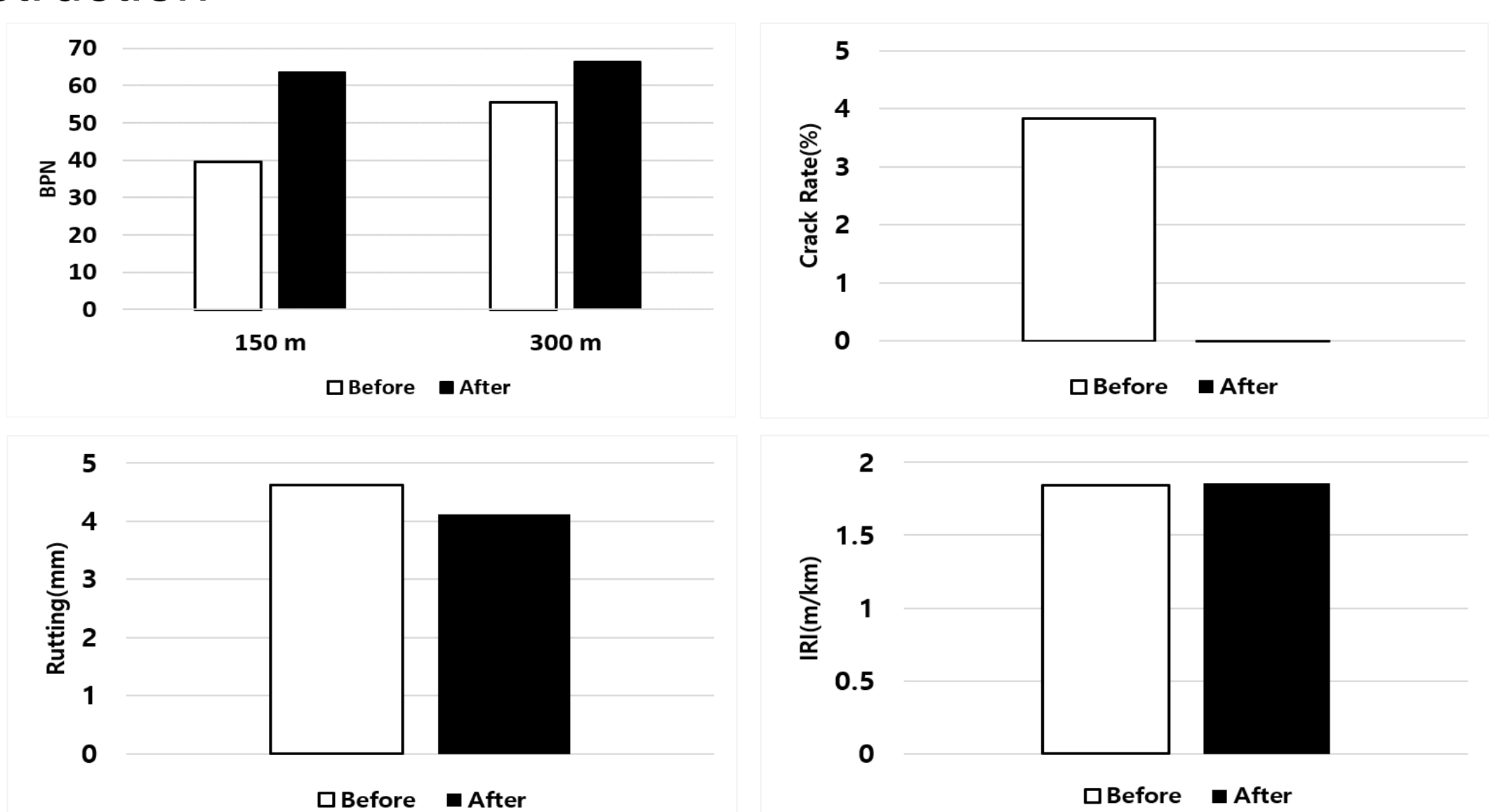
3. Mixture

- All tests performed using lab materials came out successful
- However, not all tests performed using field materials did satisfy the standard specifications

Properties	Criteria	Lab Material	Field Material
Wet Cohesion, kg/cm	@30minutes 12~	18.3 [OK]	15 [OK]
	@60 minutes 20~	20.7 [OK]	20 [OK]
Wet-track Abrasion Loss @1hour, g/m ²	~538	327 [OK]	231.1 [OK]
Wet-stripping, %	90~	95 [OK]	90 [OK]
Loaded Wheel	Sand Adhesion, g/m ²	475 [OK]	560 [NG]
	Vertical Displacement, %	0 [OK]	More than 10% [NG]
	Lateral Displacement, %	0 [OK]	More than 5 % [NG]

4. Surface Condition

- It was noticed that the surface condition was enhanced after the construction



4. Conclusion

- For both lab and field materials when tested separately, some of the tested parameters did not satisfy the specified standards.
- British pendulum test results increased significantly. Cracks were successfully filled, and rutting was minimized. There were no significant changes on the IRI, and its ranges are acceptable
- Overall, pavement condition was enhanced, and the section will continue to be constantly maintained to achieve its maximum service life

5. Acknowledgement

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