High-load-bearing, high-strength paving: "Super As-Con (Asphalt Concrete) Pavement" series

تعبيد طرق ذات متانة عالية مقاومة للأحمال الثقيلة
سلسلة تعبيد الطرق بالخرسانة الأسفلتية الفائقة

Conventional heavy traffic paving

Improved Type II asphalt concrete, semi-flexible compositions consisting of open-graded asphalt injected with cement milk, and concrete compositions are among the most commonly used types of conventional heavy traffic pavement. However, Improved Type II asphalt concrete and ordinary semi-flexible compositions are often susceptible to cracks and dents under the stress of vehicle engine vibration or static loading, eventually leading to surface layer destruction.

Super As-Con (Asphalt Concrete) Pavement series

Ultra Pave H

Ultra Pave H is a paving composition that provides good fluidity resistance, oil resistance and resistance to stationary steering while also offering levels of static load bearing capacity that are equivalent to concrete paving. It is a semi-flexible paving composition that combines the durability of concrete paving and the flatness and deflection compliance of asphalt paving.

Super Epo As-Con

Super Epo As-Con is an epoxy resin-added asphalt paving composition that offers good fluidity resistance, oil resistance and resistance to stationary steering while providing superior deflection compliance. Unlike ordinary semi-flexible paving compositions, Super Epo As-Con does not generate unwanted particles, making the paved surface ready for traffic in only several hours after installation.

Main agent
White pallet
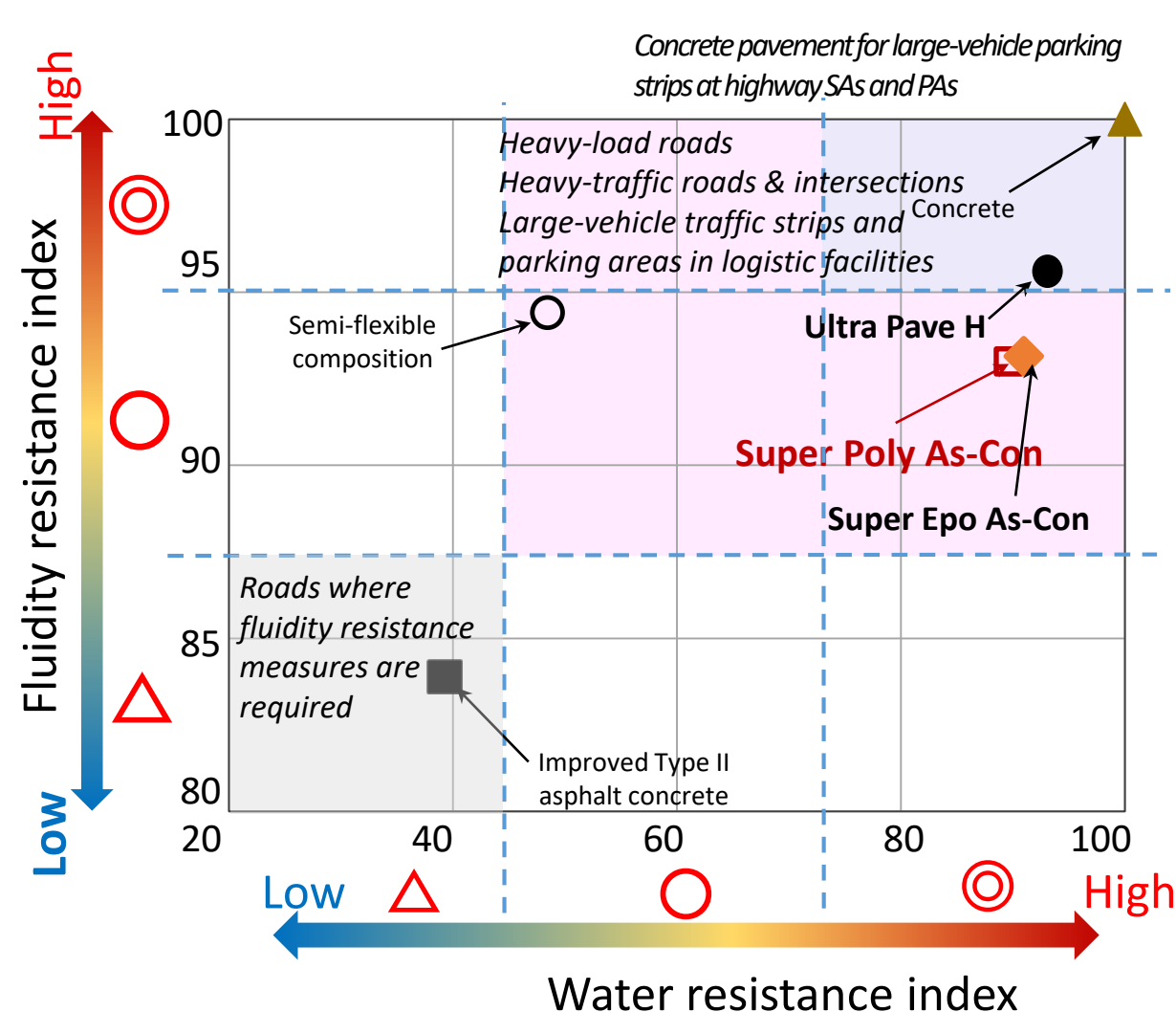
Curing agent
Wax-like substance, double-packed
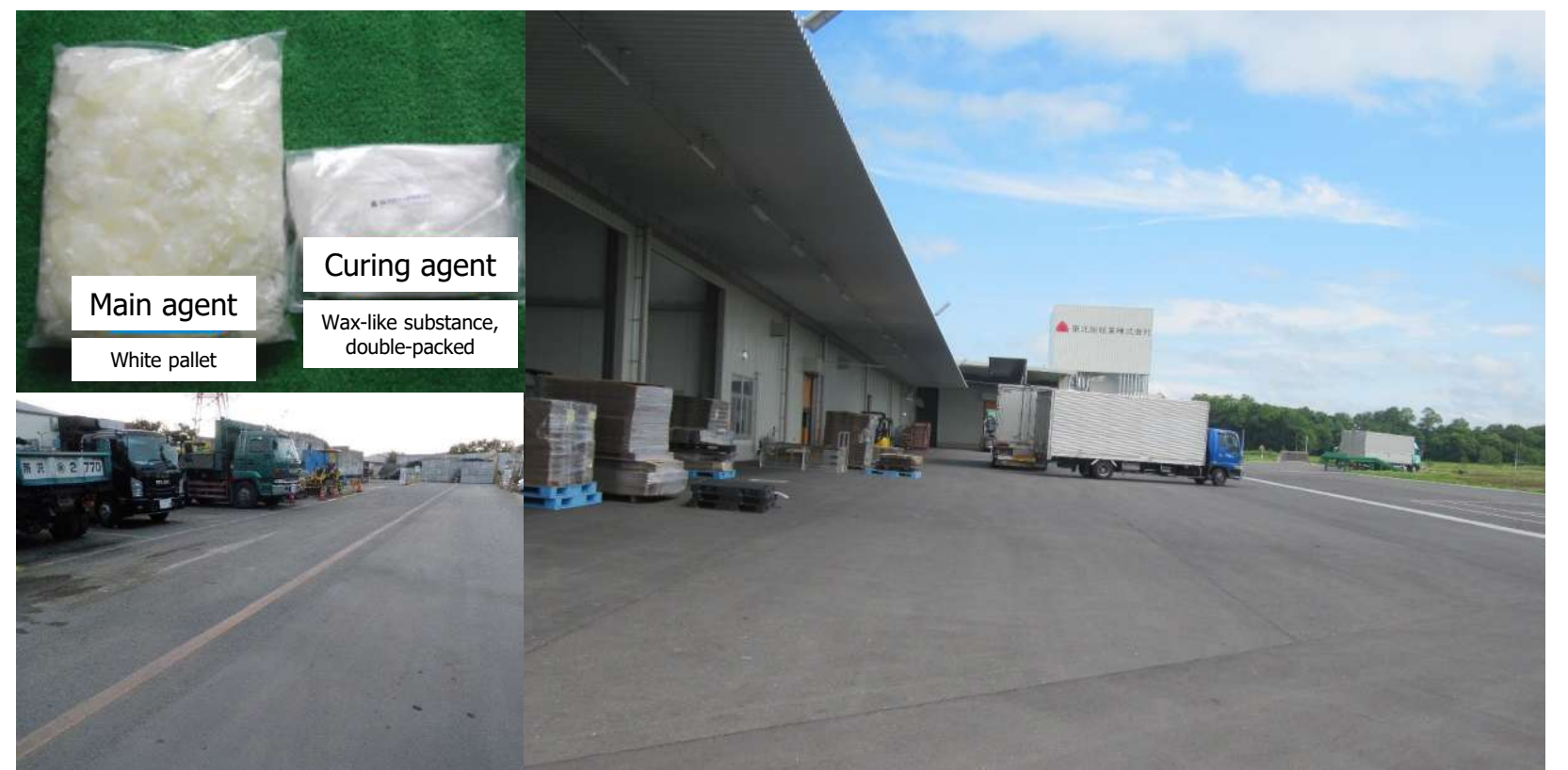
Super Poly As-Con

While offering similar physical properties as those of Super Epo As-Con, the use of thermoplastic polyester resin additive in Super Poly As-Con makes the composition as easily installable as ordinary asphalt paving. The composition can also be reheated for compaction.
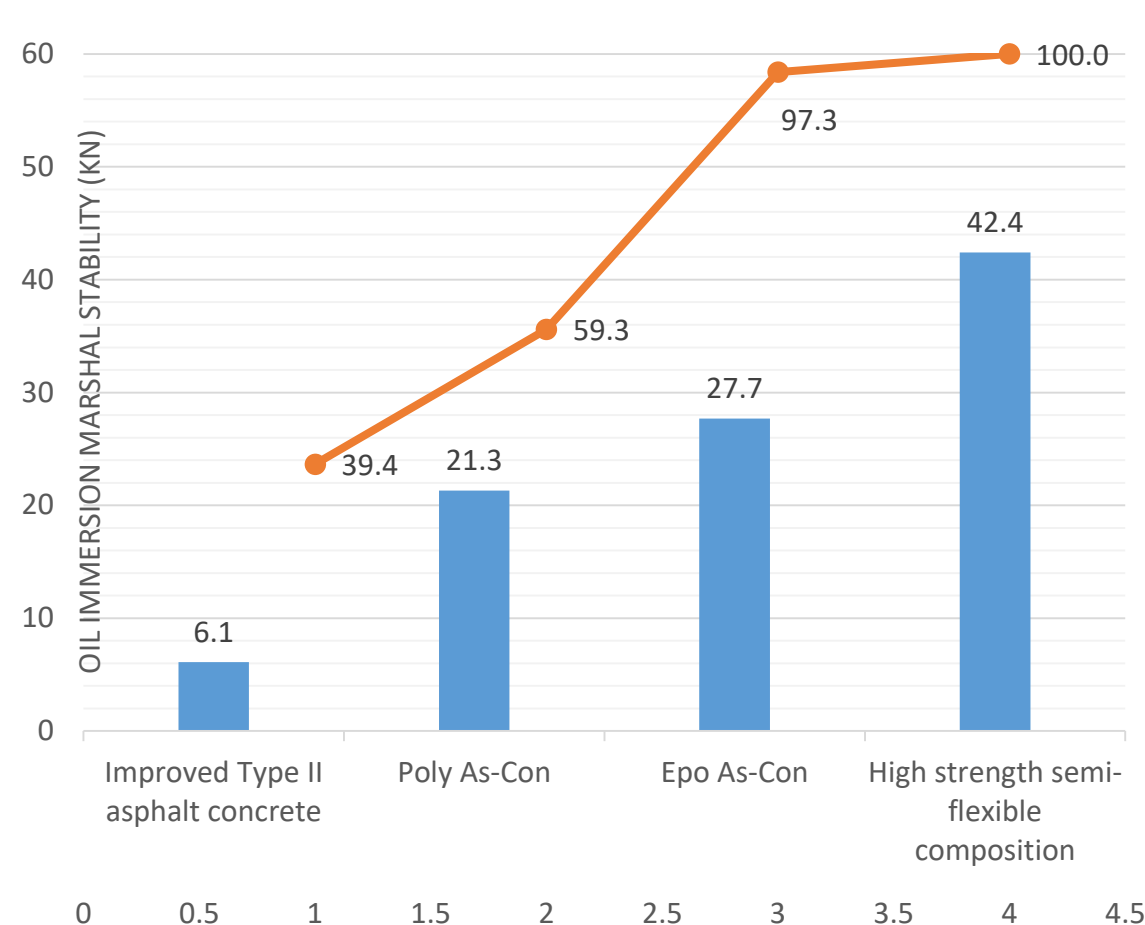
Appearance of polyester additive (NT-2500)

Hamburger wheel tracking (HWT) test

Fluidity resistance index
High
Low

Water resistance index
Low
High

Concrete pavement for large-vehicle parking strips at highway SAs and PAs

Heavy-load roads
Heavy-traffic roads & intersections
Large-vehicle traffic strips and parking areas in logistic facilities

Concrete

Semi-flexible composition

Ultra Pave H

Super Poly As-Con

Super Epo As-Con

Roads where fluidity resistance measures are required

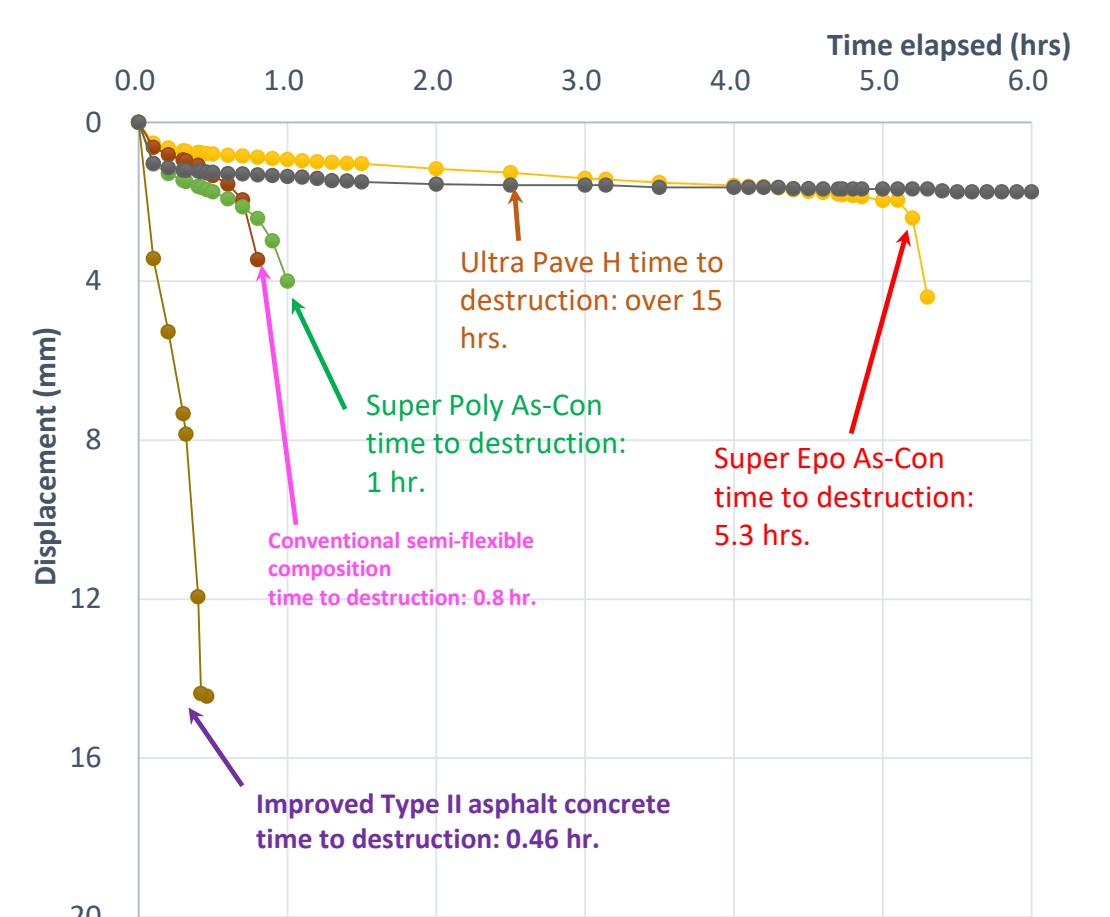Improved Type II asphalt concrete

Fluidity resistance and water resistance indices based on HWT test results with the base of concrete pavement as 100

Oil immersion Marshal stability

OIL IMMERSION MARSHAL STABILITY (KN)
OIL IMMERSION RESIDUAL STABILITY (%)

Improved Type II asphalt concrete: 6.1 / 39.4
Poly As-Con: 21.3 / 59.3
Epo As-Con: 27.7 / 97.3
High strength semi-flexible composition: 42.4 / 100.0

Bending creep test

Time elapsed (hrs)
Displacement (mm)

Ultra Pave H time to destruction: over 15 hrs.

Super Poly As-Con time to destruction: 1 hr.

Conventional semi-flexible composition time to destruction: 0.8 hr.

Super Epo As-Con time to destruction: 5.3 hrs.

Improved Type II asphalt concrete time to destruction: 0.46 hr.

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Low Noise / Porous Asphalt Pavement

<div dir="rtl">

تعبيد الطرق بالأسفلت المسامي / الخافض للضوضاء

</div>

Porous Asphalt Pavement   Normal Asphalt Pavement

Outline

Porous Asphalt Pavement (AMENI-PHALT S Series) has the function of absorbing noise and draining water.
This pavement is applicable to heavy traffic roads as the pavement provided with characteristic of low noise and rapid draining. The characteristic is acquired by improvement of high temperature stability and durability of high viscosity improved asphalt. The series is consisted with type S focused on draining effect, type SS focused on low noise effect and type SSS which has double layer structure having type SS as upper layer and type S as lower layer to improve the both of low noise effect and draining effect.
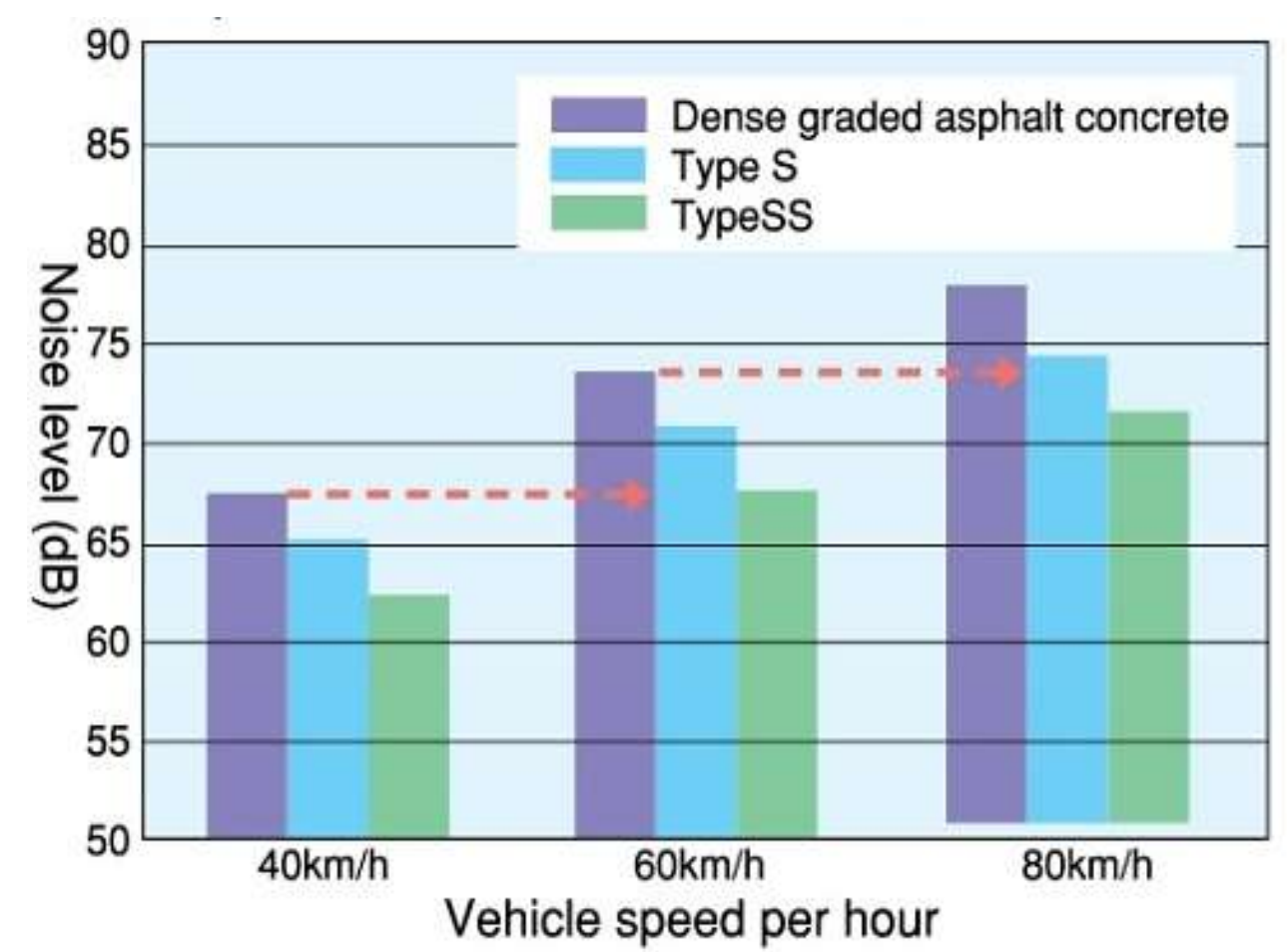
Pavement Cross Section

Type S
(Maximum aggregate size 13 or 20mm)

30 to 50mm

Binder Course (Impermeable layer)
Base Course

Type SS
(Maximum aggregate size 5～10mm)

20 to 30mm

Binder Course (Impermeable layer)
Base Course

Type SSS

Type SS (Maximum aggregate size 5mm)

20mm
30 to 40mm

Type S (Max. aggregate size 13 or 20mm)

Binder Course (Impermeable layer)
Base Course
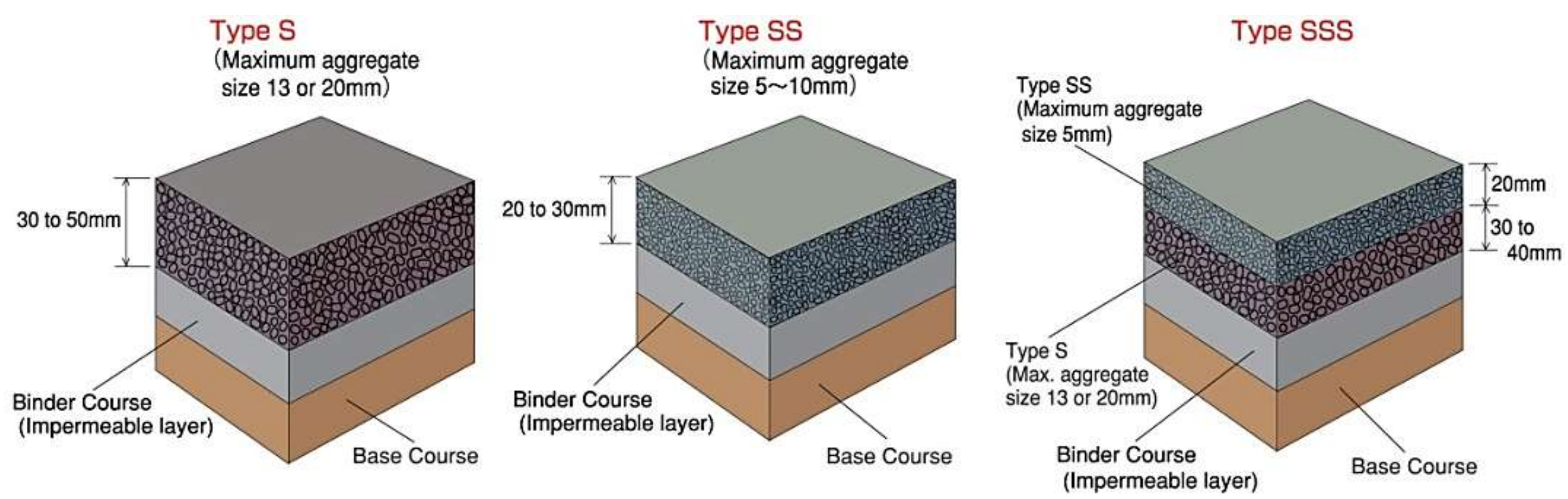
Characteristics

Comparison of features between Drainage Pavement and Permeable Pavement

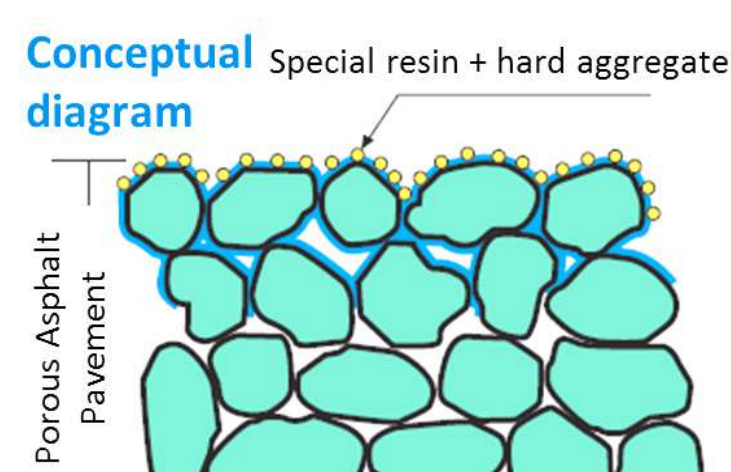| Section	Item	Drainage Pavement	Permeable Pavement
Social Environment (Traffic Safety)	Reducing traffic noise	Effective	
	Improving drivers' visibility in the rain	Effective	
	Improving traffic safety in the rain	Effective	Effective
	Improving walk condition in the rain	Effective	Effective
Natural Environment	Retaining rainwater		Effective
	Improving underground ecological system		Effective
	Maintaining undergrand water and restraining subsidence		Effective

Example of Traffic Noise Measurement

Noise level (dB)

Dense graded asphalt concrete
Type S
TypeSS

Vehicle speed per hour
40km/h   60km/h   80km/h

Our other Porous Pavements

Porous Concrete Pavement (Ameni-Crete)

Pavement Cross Section

Ameni-Crete

Non-Permeability Asphalt Layer
Aggregate Base Layer
Sub Base Layer

15～20cm
4cm
10cm
25cm

Sub Grade CBR >4%

Pavement Cross Section

t=4～5cm
Ameni-Crete
Adhesion mortar

Concrete Pavement
t=20～25cm
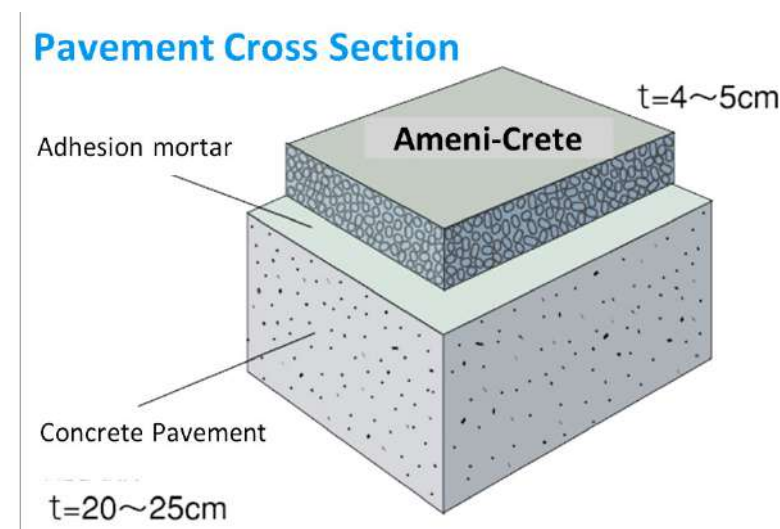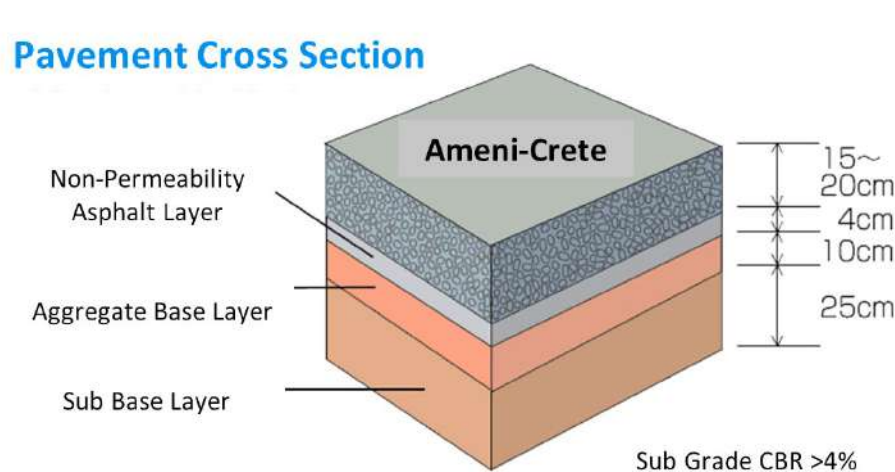
Top Coat for Porous Pavement (Ameni-Coat)

Conceptual diagram   Special resin + hard aggregate

Porous Asphalt Pavement

Before spraying

After spraying

We have other various type of porous pavement construction methods. Please feel free to ask us for further detail.

AI-assisted stereo camera system with advanced image analysis capability distinguishes between humans and inanimate objects
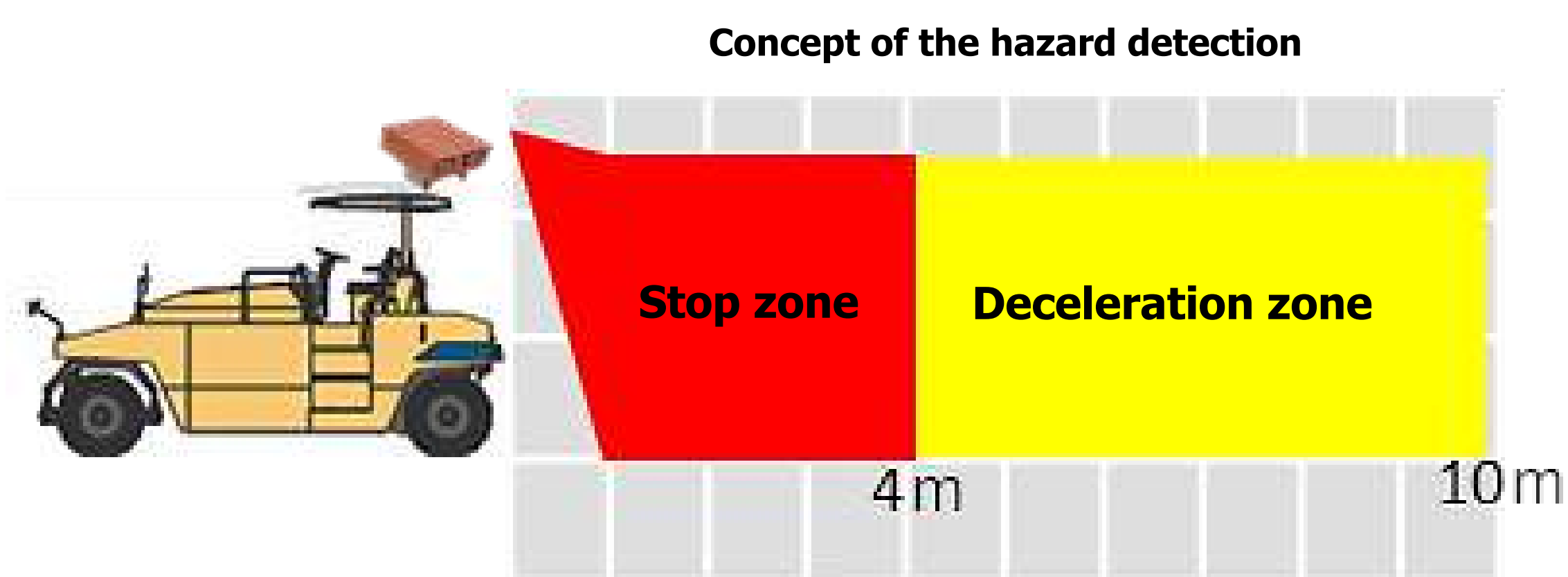
The AI technology detects and recognizes humans separately from inanimate objects.

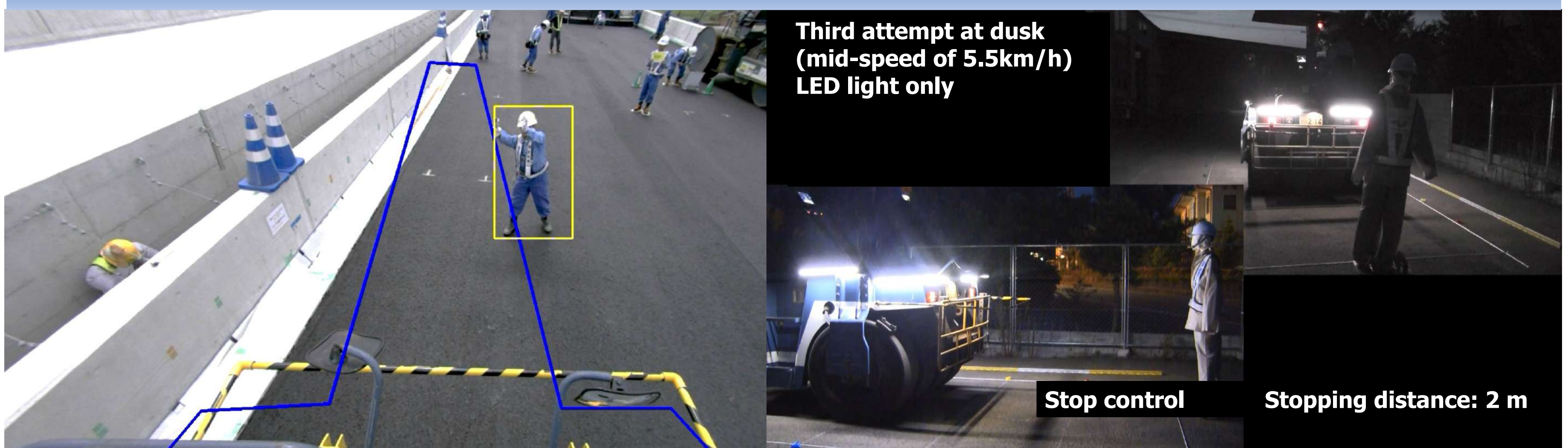## Freely reconfigurable detection area to best suit the field environment

By using a computer or a PC panel, the hazard detection area can be easily reconfigured to any desired one within the stereo camera view range.

Controller unit for automatic deceleration and stopping

The controller unit is capable of controlling the drive lever of the vehicle for automatic deceleration and stopping.

Concept of the hazard detection

Stop zone | Deceleration zone
4m | 10m

Excellent image analysis capability

Third attempt at dusk (mid-speed of 5.5km/h) LED light only

Stop control | Stopping distance: 2 m

The advanced image analysis system will detect human presence even when only a person's foot gets inside the defined detection area. The yellow frame shown above indicates that the system has recognized human presence in the control distance range so that the vehicle will be automatically slowed down by the control unit.

The image analysis system has superb object recognition capability so that humans will be dependably distinguished from inanimate objects during dark hours. The system has been validated to work reliably in poor visibility conditions such as rain, backlight shone from behind the objects, and twilight hours.

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Test tracks by Nippon Road: Skid panel construction
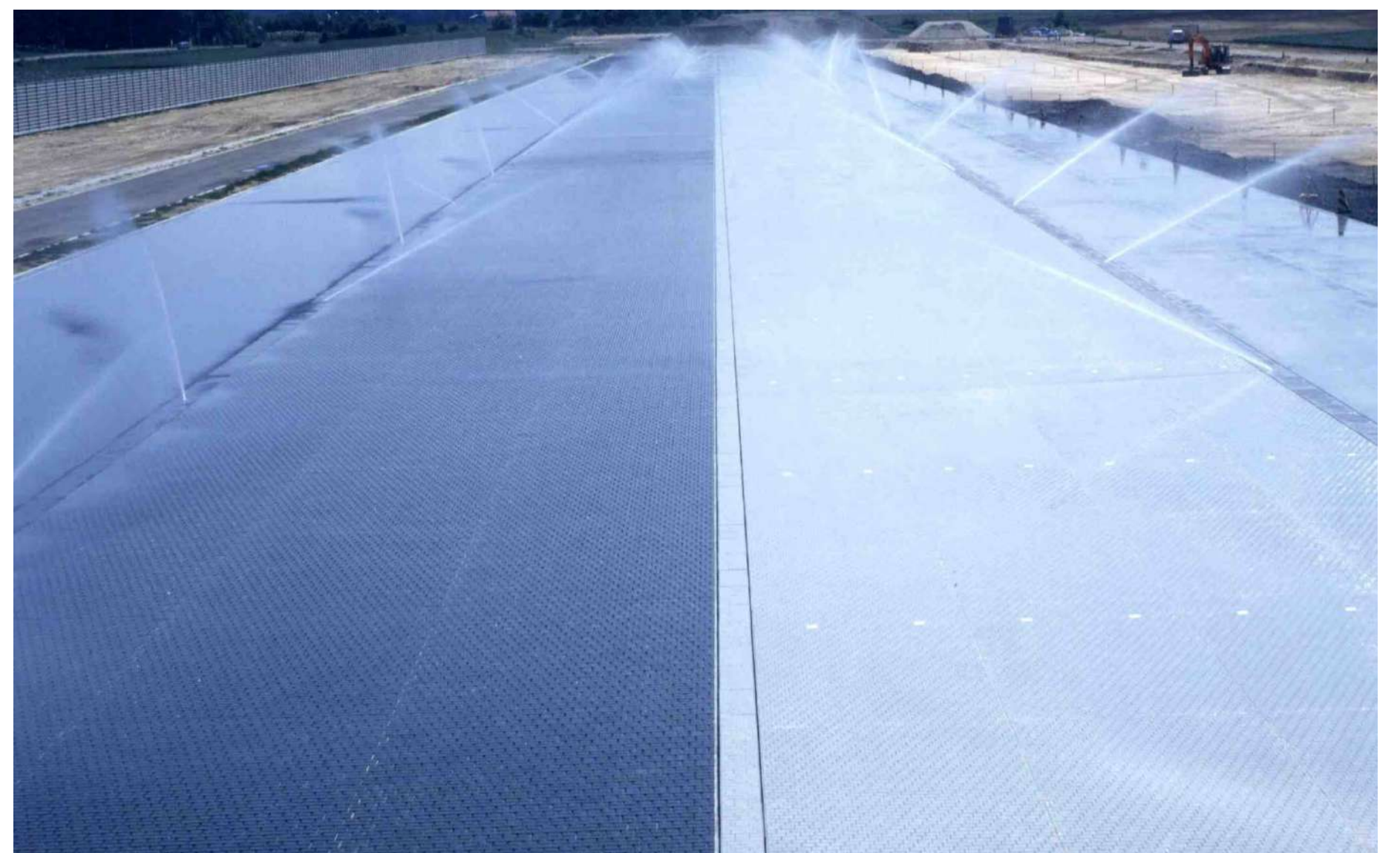
مسار اختبار طرق اليابان
أسلوب ألواح الانزلاق

A new proposal: Skid panel construction

"Skid panel construction" is Nippon Road's originally developed low-μ track surface creation technology.

Factory-built components offer a consistent track surface quality free of weather conditions during construction. The one-piece molding process helps prevent tile separation, contributing to significant durability improvement.

Elimination of the piece-by-piece tile gluing process by hand also greatly helps reduce work time.

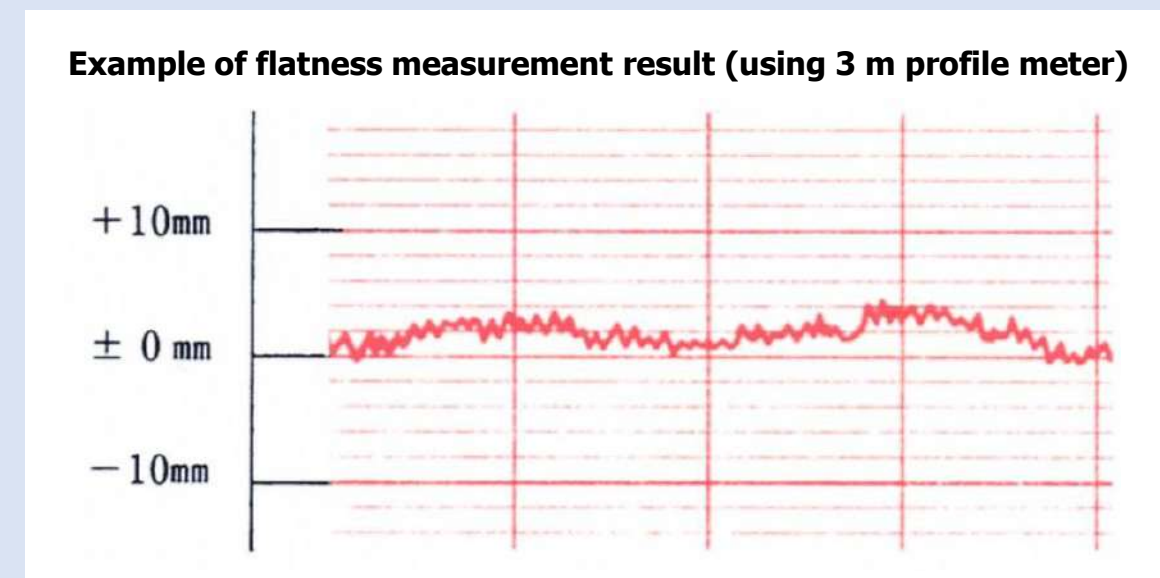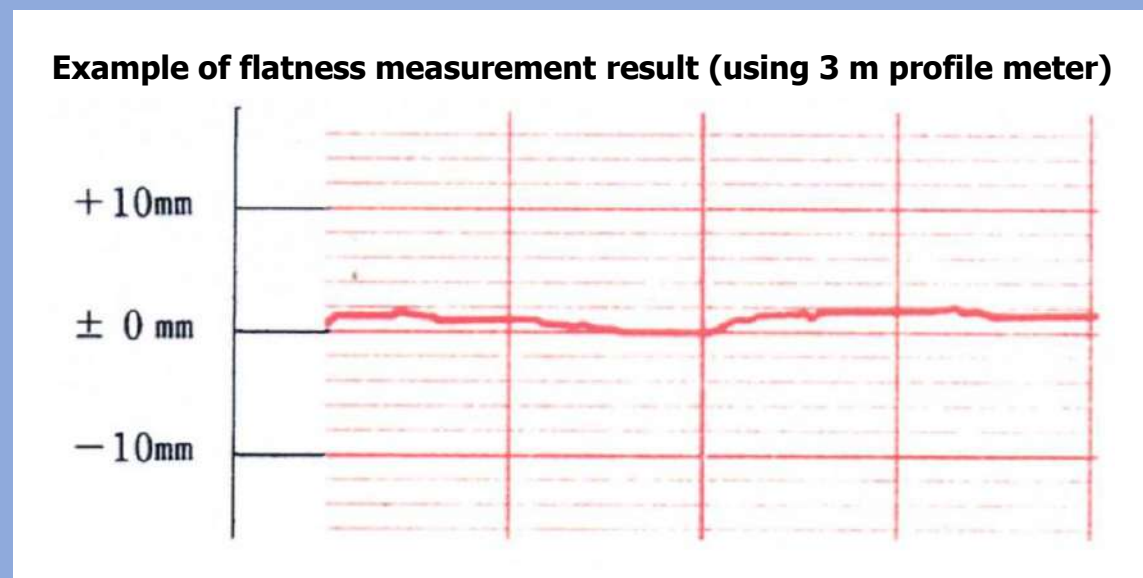With a choice of different tiles, the process caters to a variety of tracks from low-μ to medium-μ surfaces.
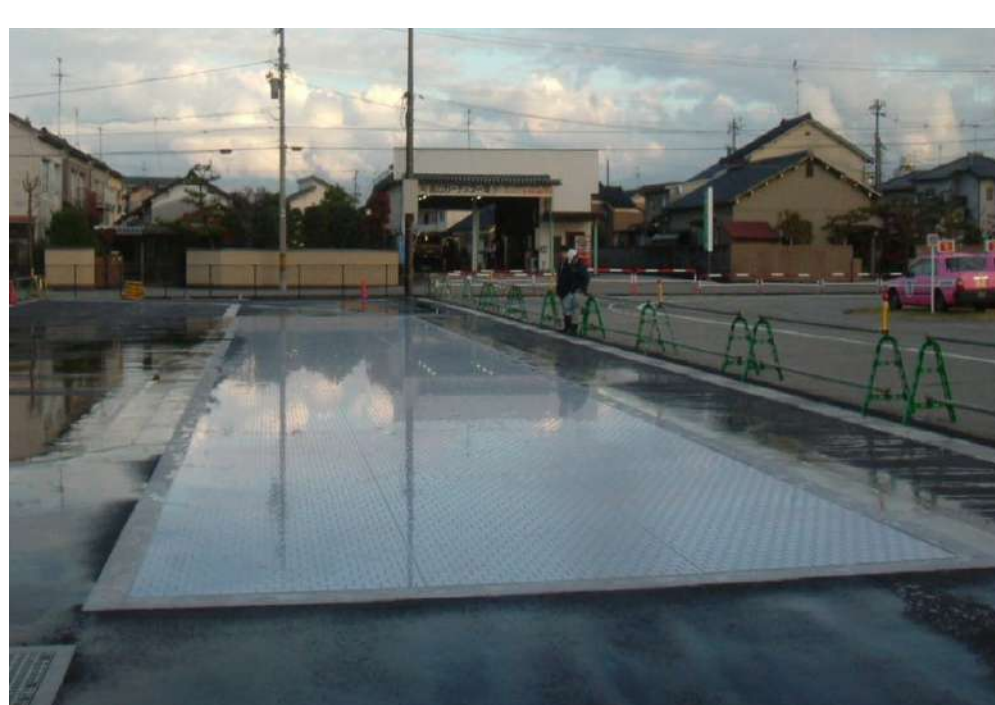
Panel construction	Hand gluing process

Comparison of flatness

Example of flatness measurement result (using 3 m profile meter)

+10mm
± 0 mm
−10mm

Example of flatness measurement result (using 3 m profile meter)

+10mm
± 0 mm
−10mm
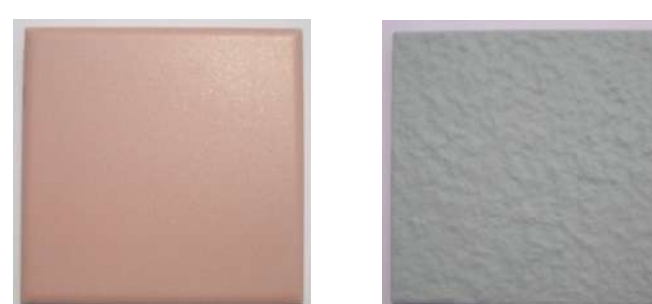
Tile choice example (Ceramic tile)

μ level

Multiple μ levels can be achieved by selecting different tiles.

Ice 0.1	Compacted snow 0.3

Tile choice example (Basalt tile)

μ level

Tile for ABS-certification testing

Compacted snow 0.2±0.05

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