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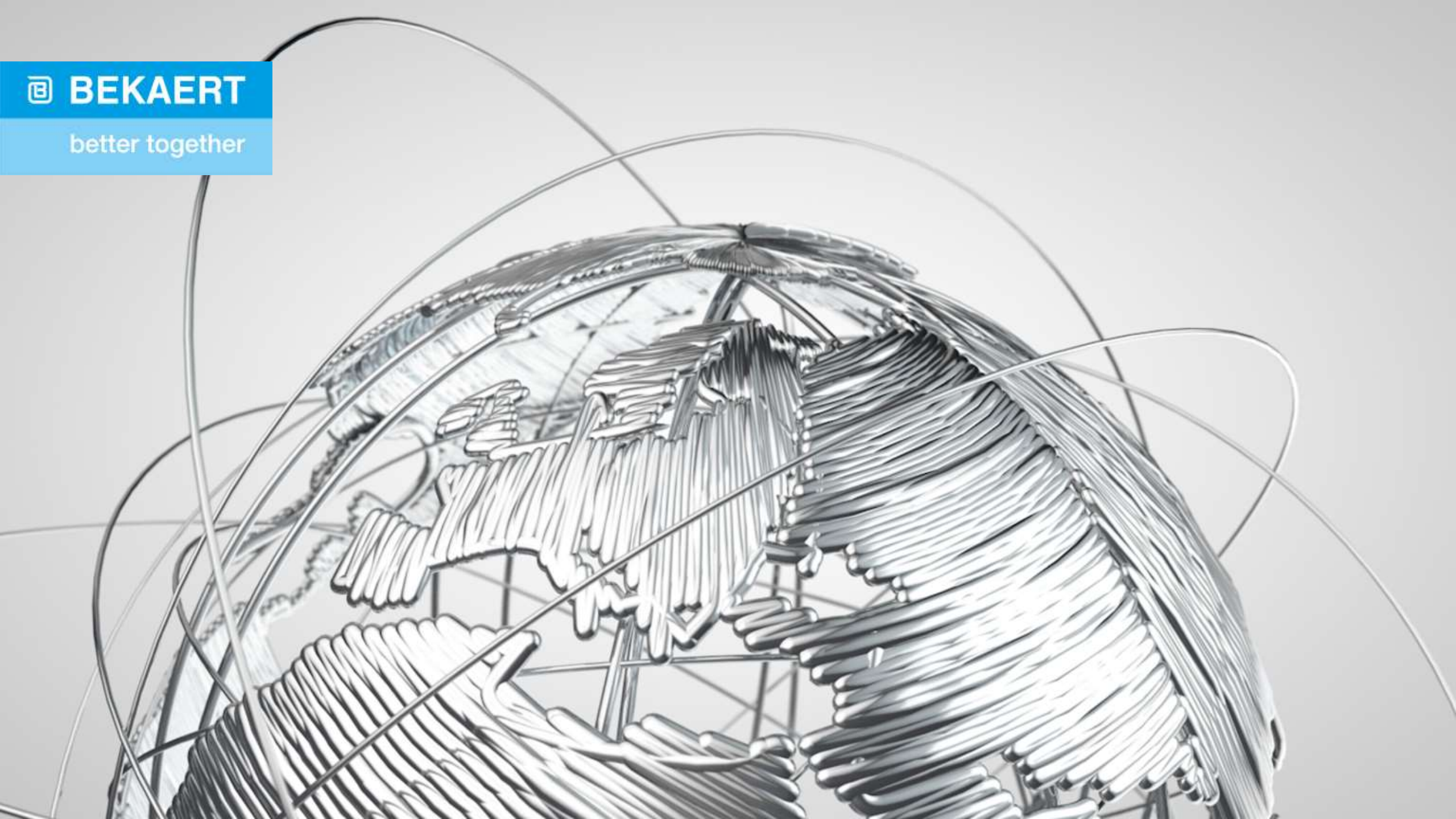

Dramix® **steel fibre**

For Concrete Slab Reinforcement

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Agenda

1. About Bekaert
2. About Dramix Steel Fiber?
3. Why Using Dramix Steel Fiber For Slab?
4. Project reference in Indonesia

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WORLD BIGGEST WIRE PRODUCER

BELGIUM
1880

120
COUNTRIES

30.000
EMPLOYEES

IDR85 T
COMBINE SALES

INDONESIA

SINCE 1996
INVESTMENT 200MIL USD
FACTORY 19.4HA
90% OF DRAMIX EXPORT

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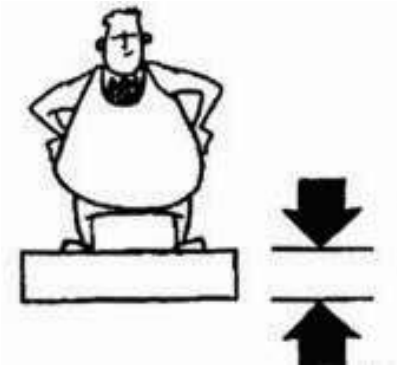
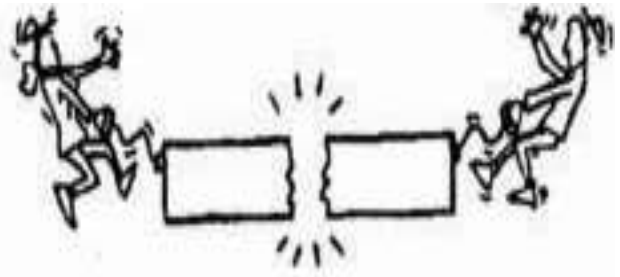
The principle of concrete reinforcement

In order to change this brittle behaviour into a more ductile behaviour, mesh, rebar or steel fibres are added. The role of the REINFORCEMENT is to increase load bearing capacity and limit crack opening.





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Pembesian konvensional

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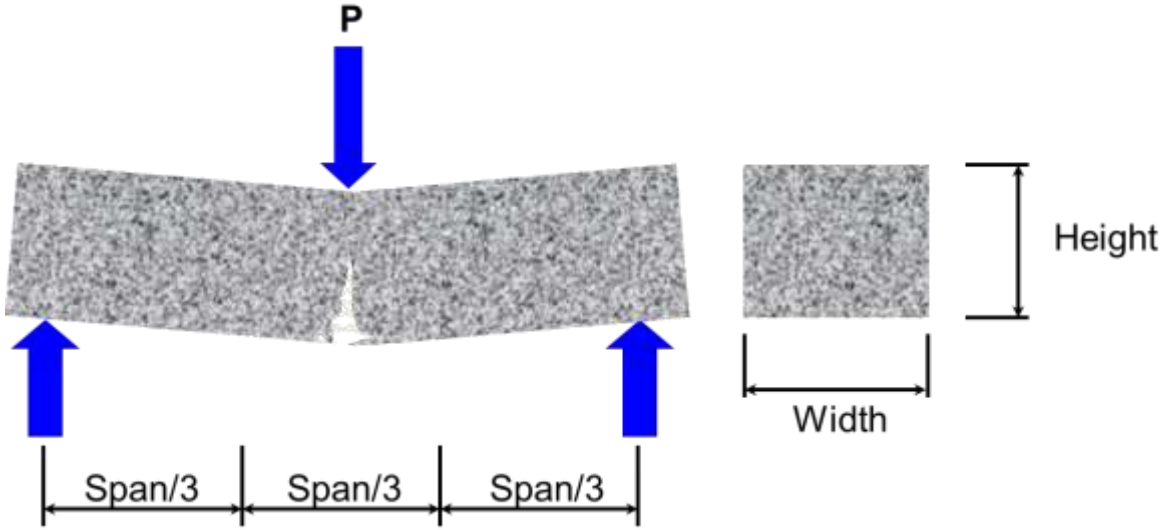
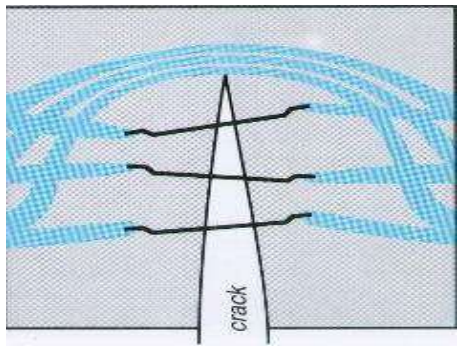
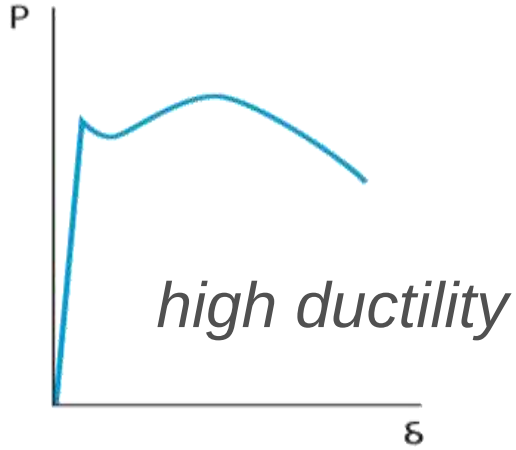
Stee Fiber

Steel fibre

is engineered to replace rebar and mesh in concrete. It’s a proven technology for more than 40 years.







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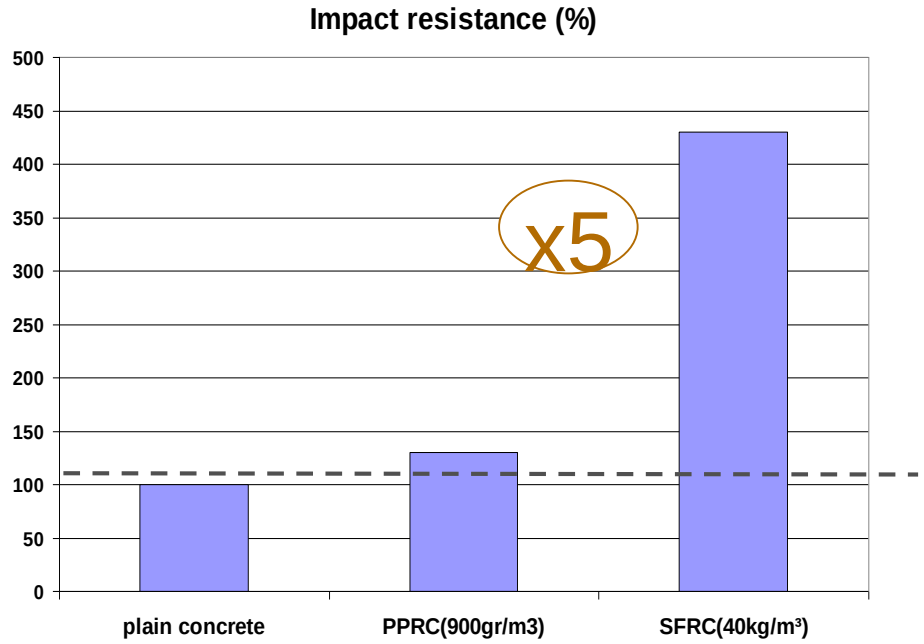
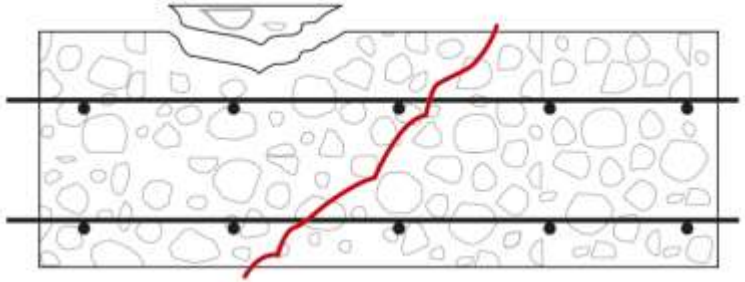
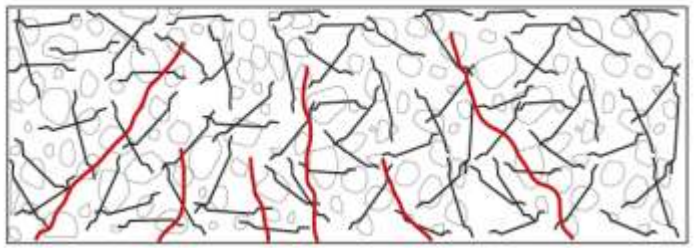
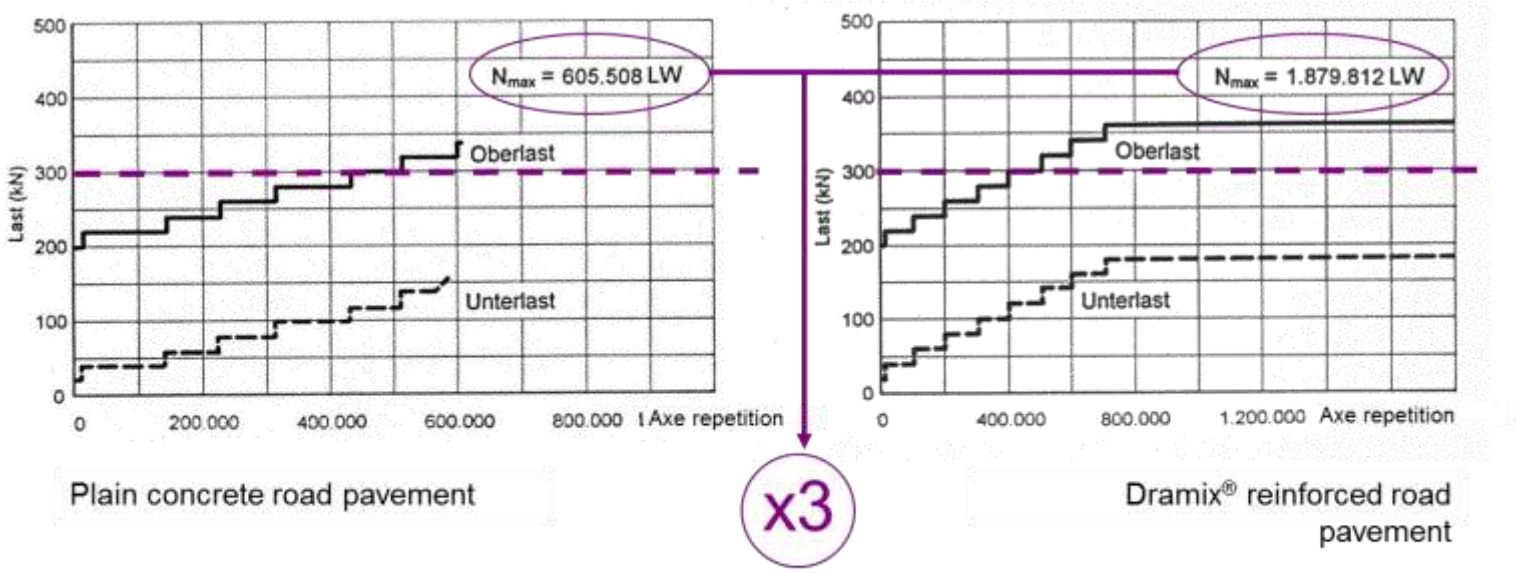
Increase impact resistance







Postpone and reduce the crack happening and increase the post-crack stiffness and load carrying capacity.



3x lebih tahan terhadap beban berulang

High fatigue resistance of fibre structure,
maintenance and repair costs are reduced.

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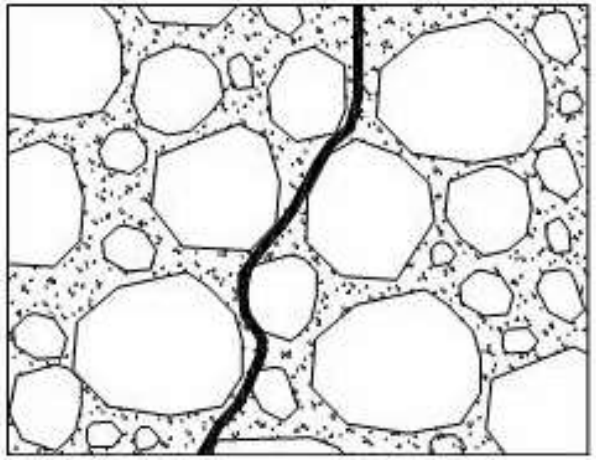
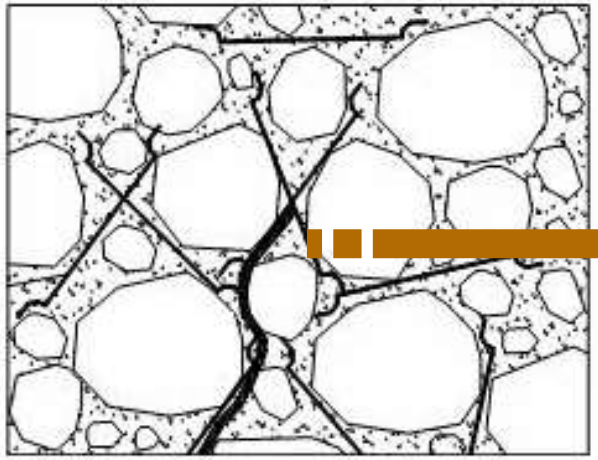
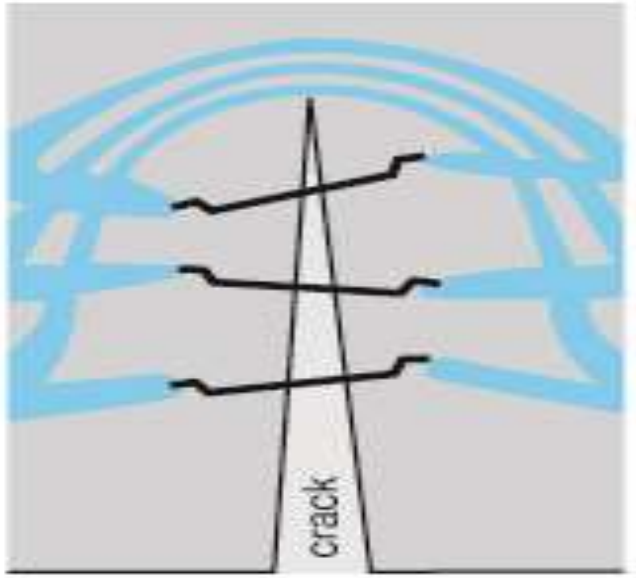
Resist crack formation

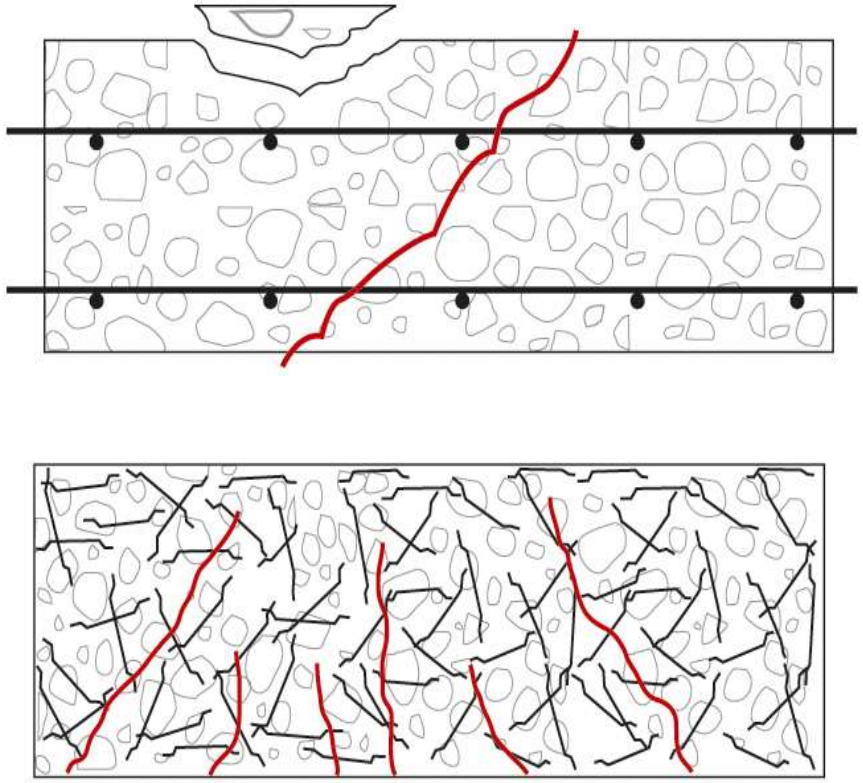


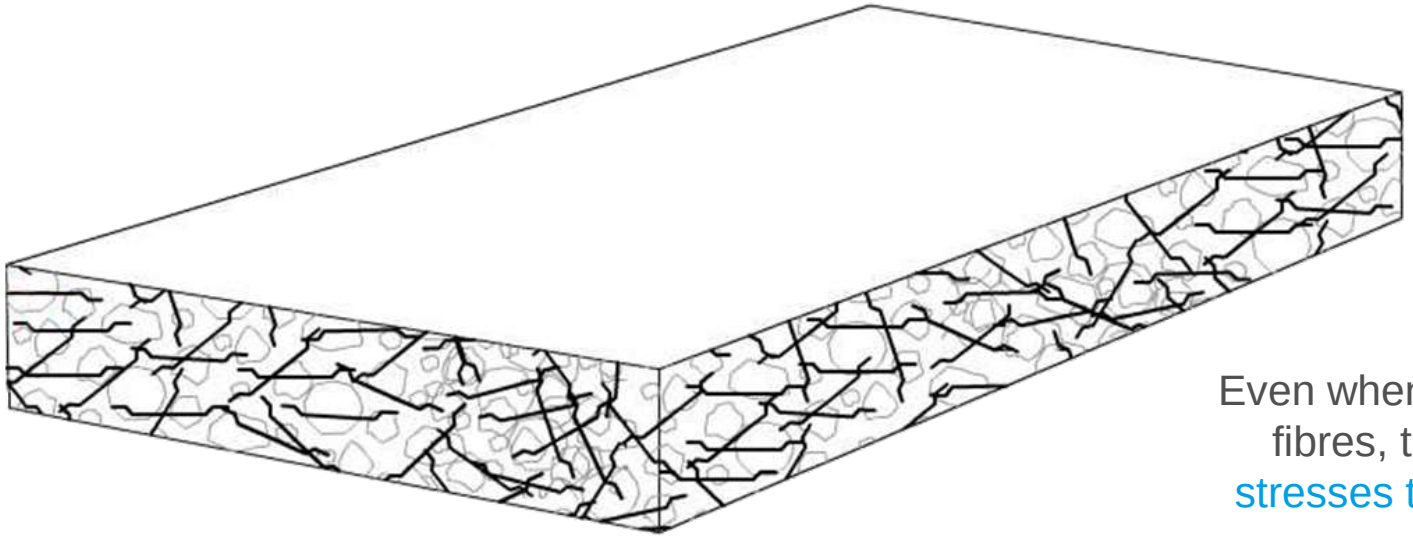




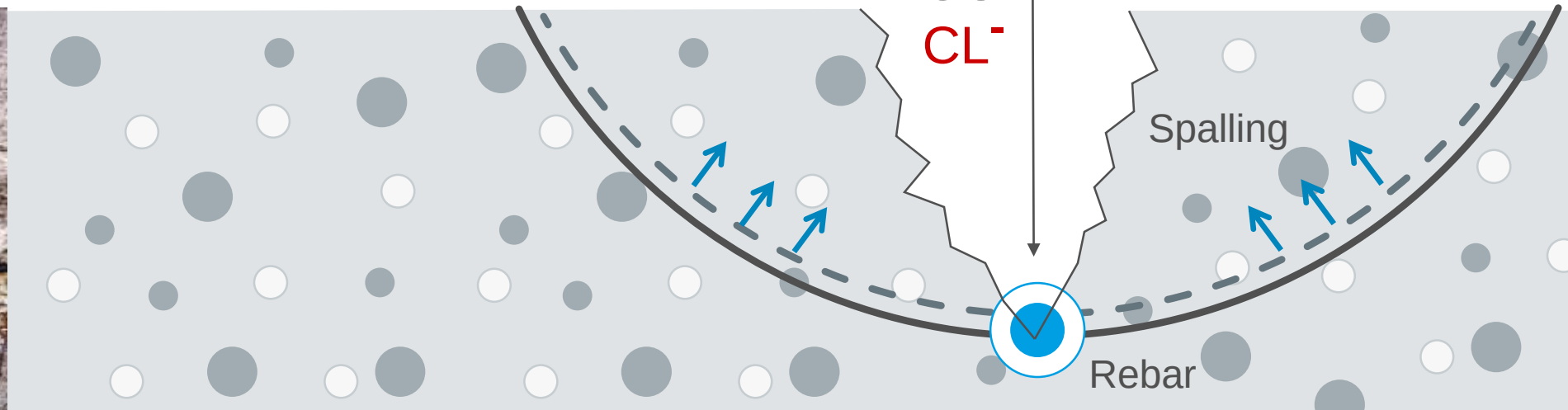
- ✓ High quantity and dispersion, make concrete ductility.
- ✓ A good ductility resist crack arising by temperature and shrinkage stress.
- ✓ High tensile strength ≥1100MPa and long anchorage.
- ✓ Well redistribute stress and keep crack fine.

INCREASE DURABILITY

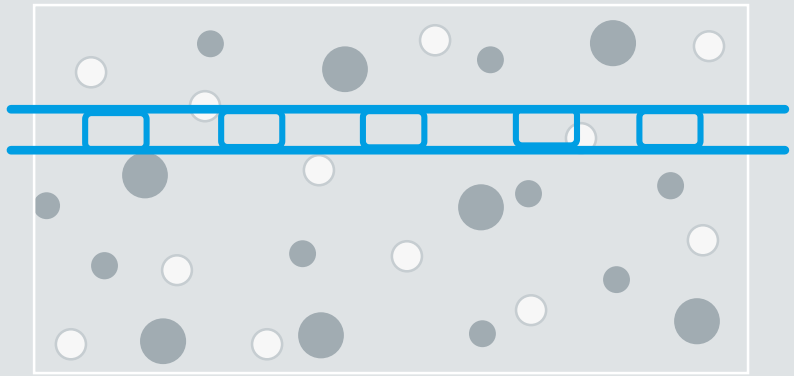




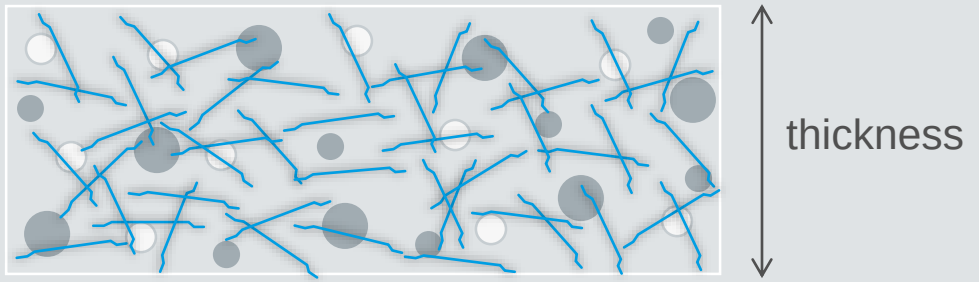
Even when steel fibres corrode, due to the geometry of the fibres, the corrosion produced does not exert enough stresses to crack the concrete, unlike in rebar, where this is a concern.



Cost effective solution



Traditional reinforcement



Steel fibre reinforcement

A thinner & cheaper floor for a given load

No need to cover steel fibre reinforcement with concrete

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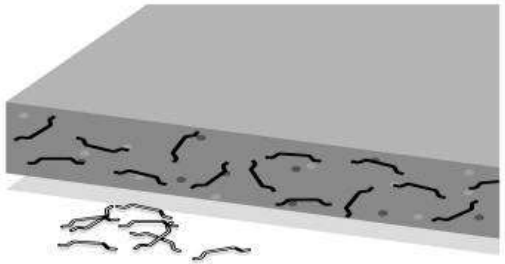
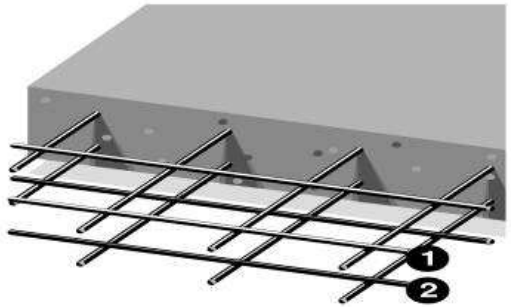
Working with steel fibres is less labour-intensive and helps you save time and money.



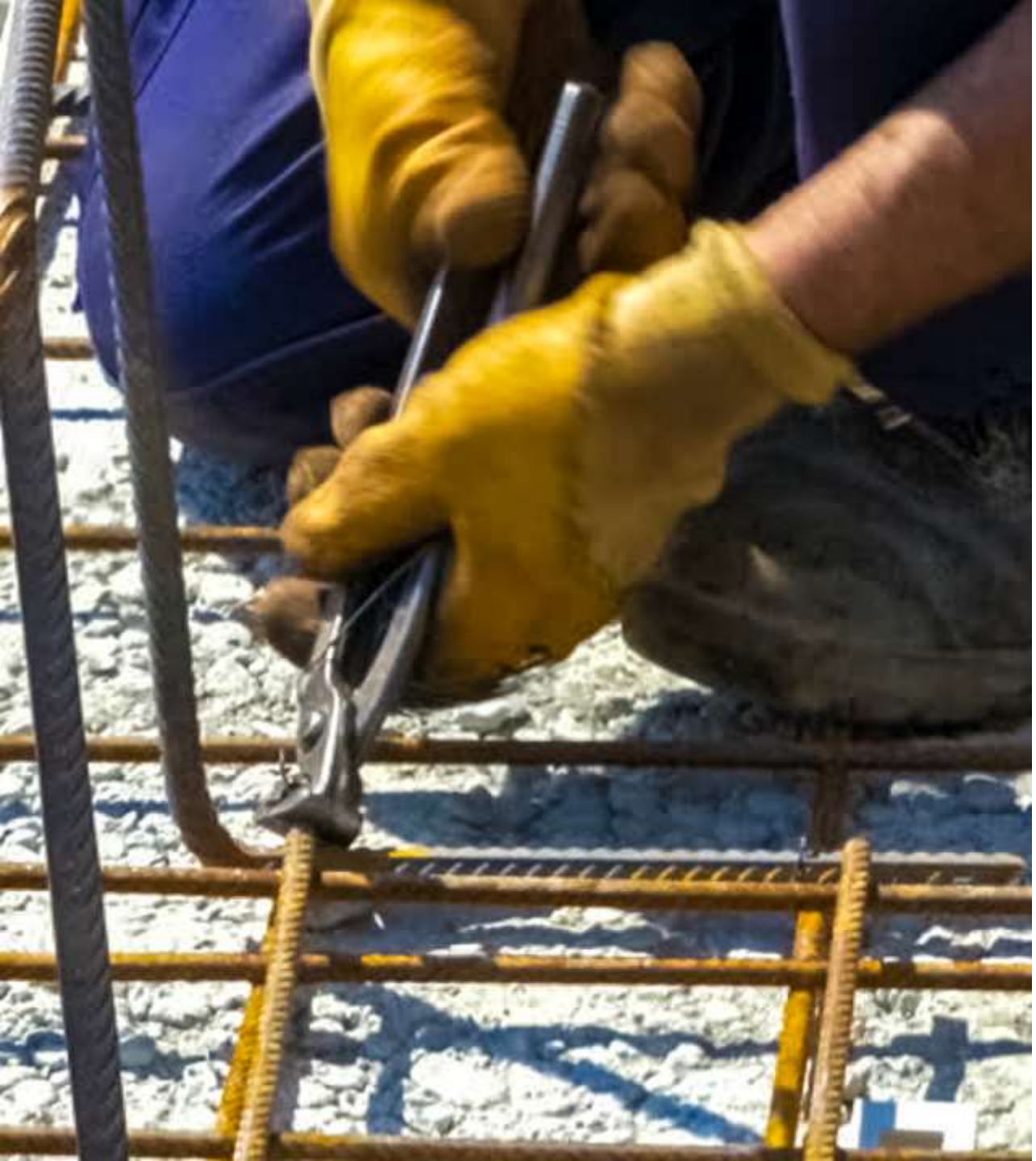
STEEL FIBRE reinforcement

1. Add the steel fibres to the concrete (at the ready mix plant or job site)
2. Pour the concrete



STEEL MESH reinforcement

1. Transport the mesh/rebar
2. Handle and stock the mesh/rebar on site
3. Place the mesh/rebar
4. Tie panels together
5. Pour the concrete



Working with fibre reinforcement not only means using less steel, but it also

takes less man hours to put in place.

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Safer jobsite conditions

Using steel fibres enhances the safety on your construction site. Reinforcement mesh and rebar not only hampers other work on your site, they are very often the cause of accidents and severe delays.

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Dramix® steel fibre reinforcement features
unique hooked ends, high tensile strength and ductility.

This results in previously unavailable levels of anchorage and crack control, creating more durable and safer structures

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Dramix® **steel fibre**

In the Public Works Sector

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Road Pavement

Pedestrian

Road Barier

Precast

Tunneling

Housing Foundation

Road Pavement

PERBAIKAN JALAN TRANSJAKARTA, JAKARTA

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PERBAIKAN JALAN TOL JORR - JAKARTA

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ROAD PAVEMENT – KAWASAN INDSUTRI, TANGERANG

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KAWASAN INDUSTRI CIKANDE – TOTAL AREA 140HA

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RIGID PAVEMENT – NGANJUK, JAWA TIMUR
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2018/8/25 10:55

RIGID PAVEMENT – NGANJUK, JAWA TIMUR

RIGID PAVEMENT – NGANJUK, JAWA TIMUR

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Pedestrian

Jogging track – Kuala Lumpur, Malaysia

Broken tile everywhere at existing walkway/ jogging track.

SFRC colored and standard grey concrete cast right on top of well-compacted crusher run and some area right on top of tile.
Saw cut every 3m spacing.

Path walk, Kuala Lumpur, Malaysia

Floor finishes

Approved 150mm thick broom finish; Artevia or other equal and approved colored and pattern including Steel Fiber 10kg/m3, dry shake hardener at 4kg/m2

(a) To floor (bicycle track) 5816m2

(b) To floor (jogging track) 5602m2

(c) To floor (walkway) 18,353 m2

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Decorative pavement (stamped concrete), Kuala Lumpur, Malaysia

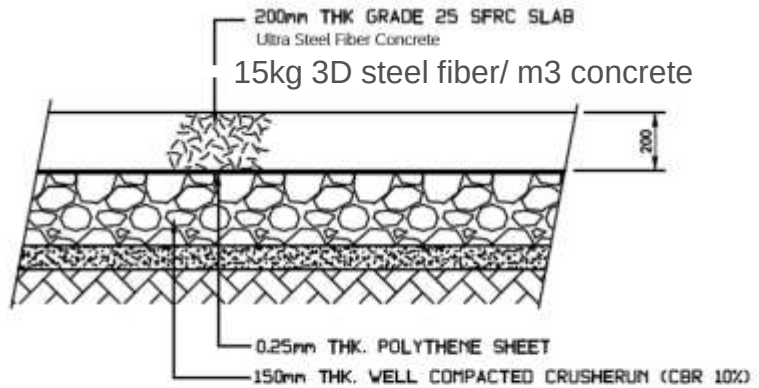
Design Summary and Recommendation

Steel Fibres Reinforced Concrete Slab on Grade Design

Concrete	:	Grade 25
Slab Thickness	:	200mm
Reinforcement	:	Steel Fibres **Wirand® FF3**
Dosage	:	15 kg/m³
Design Sub-Base	:	CBR 10%

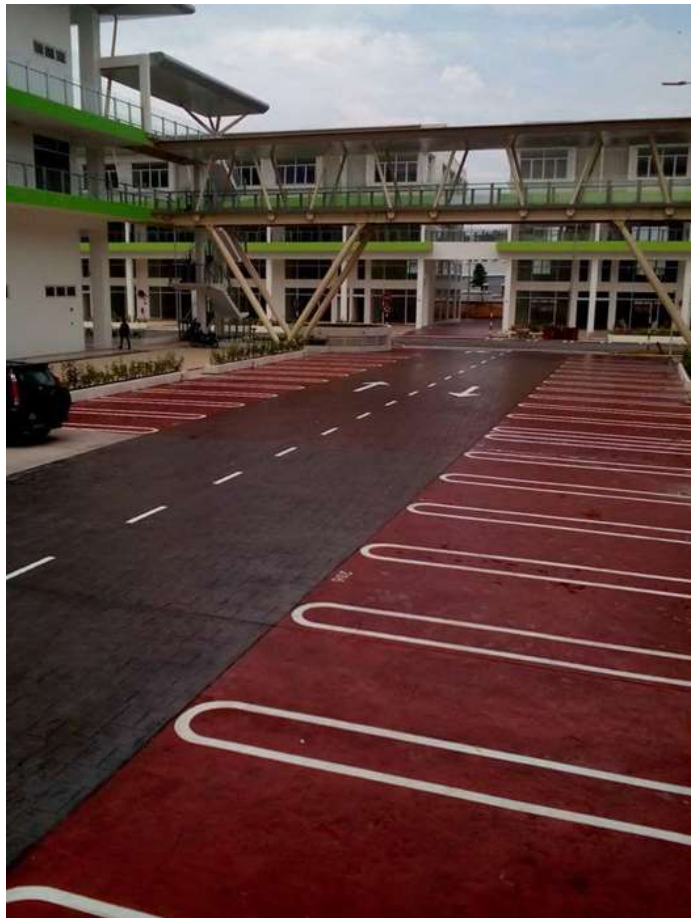
Design Loadings :

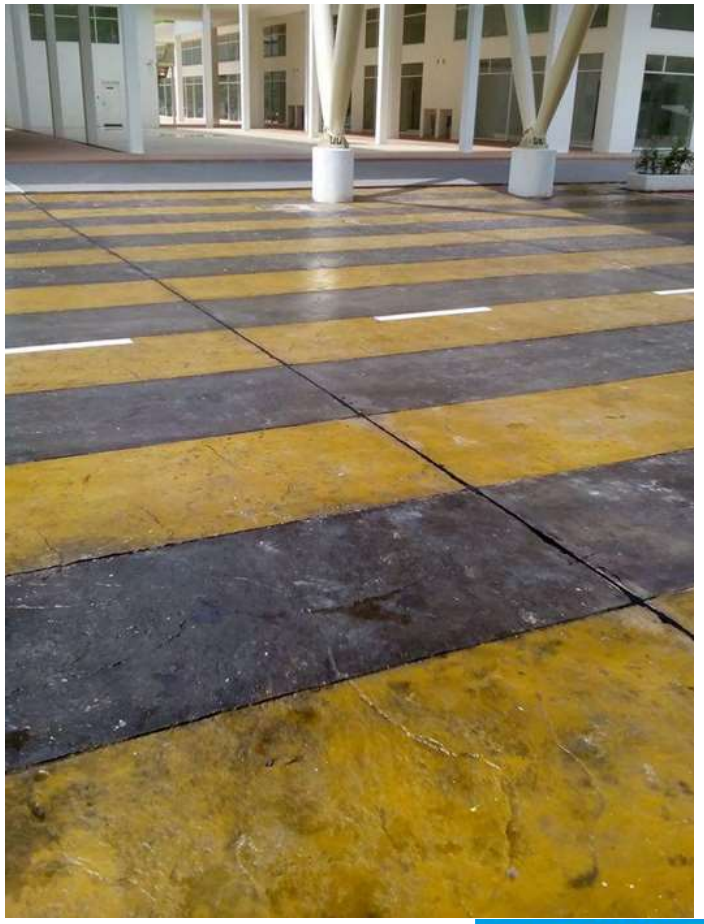
- Uniform Distributed Load : 20 kPa
- Point / Racking Load : 30 kN
- Forklift (total weight) : 7 ton (max wheel load of 3.3 ton)
- Truck (total weight) : 45 ton (max wheel load of 7.5 ton)



TYPICAL SFRC SLAB ON GRADE DETAILS

Anggun City – Drive Way, Malaysia 2,200m2 with 20kg Steel Fiber (Stamped Concrete)





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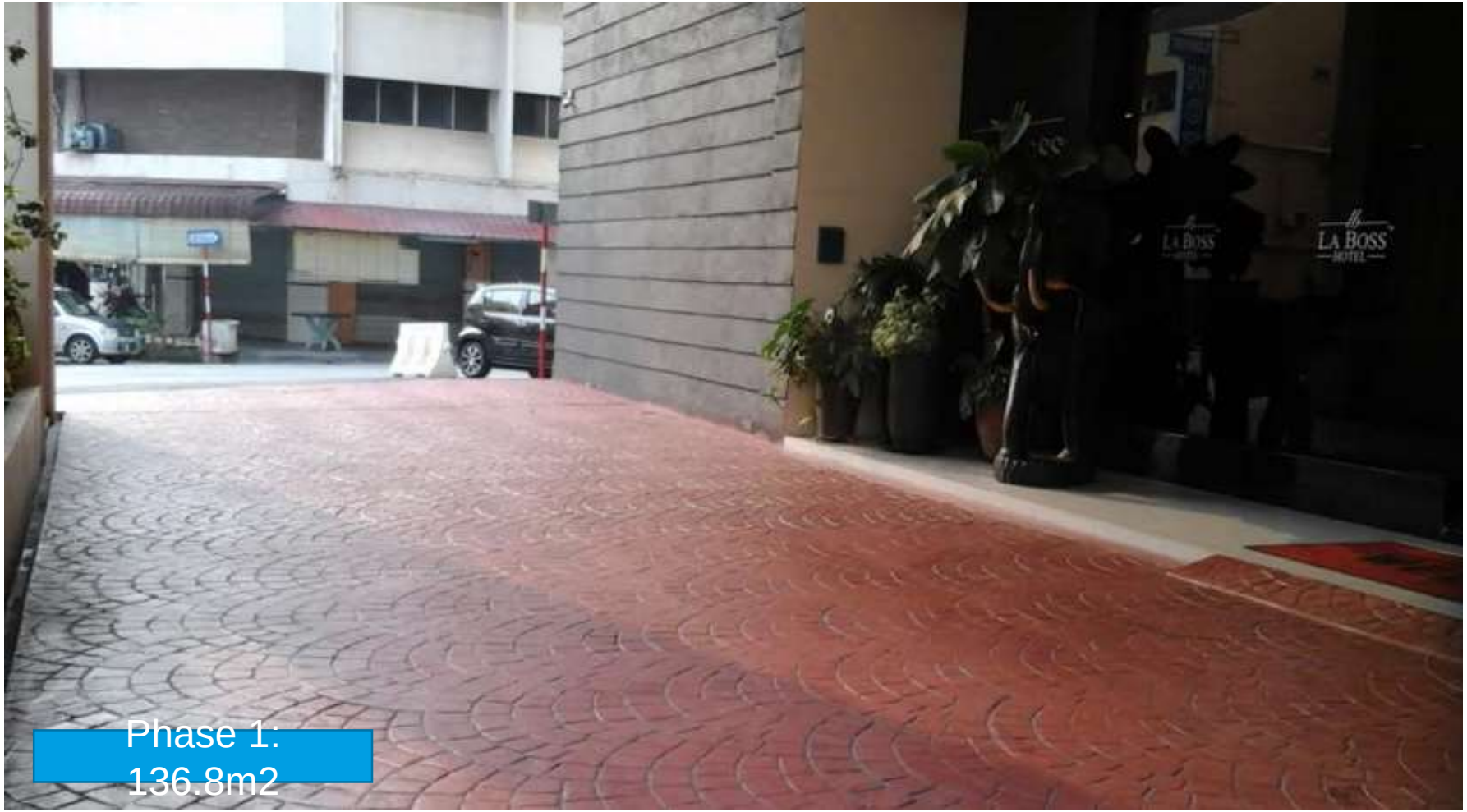
La Boss Hotel, Melaka (Drop off area)



Artevia Print, G35 @ 180mm thick with 15kg 3-D Steel Fiber

Texture: European Fan ; Color: Autumn Brown

Year of Completion : 2014

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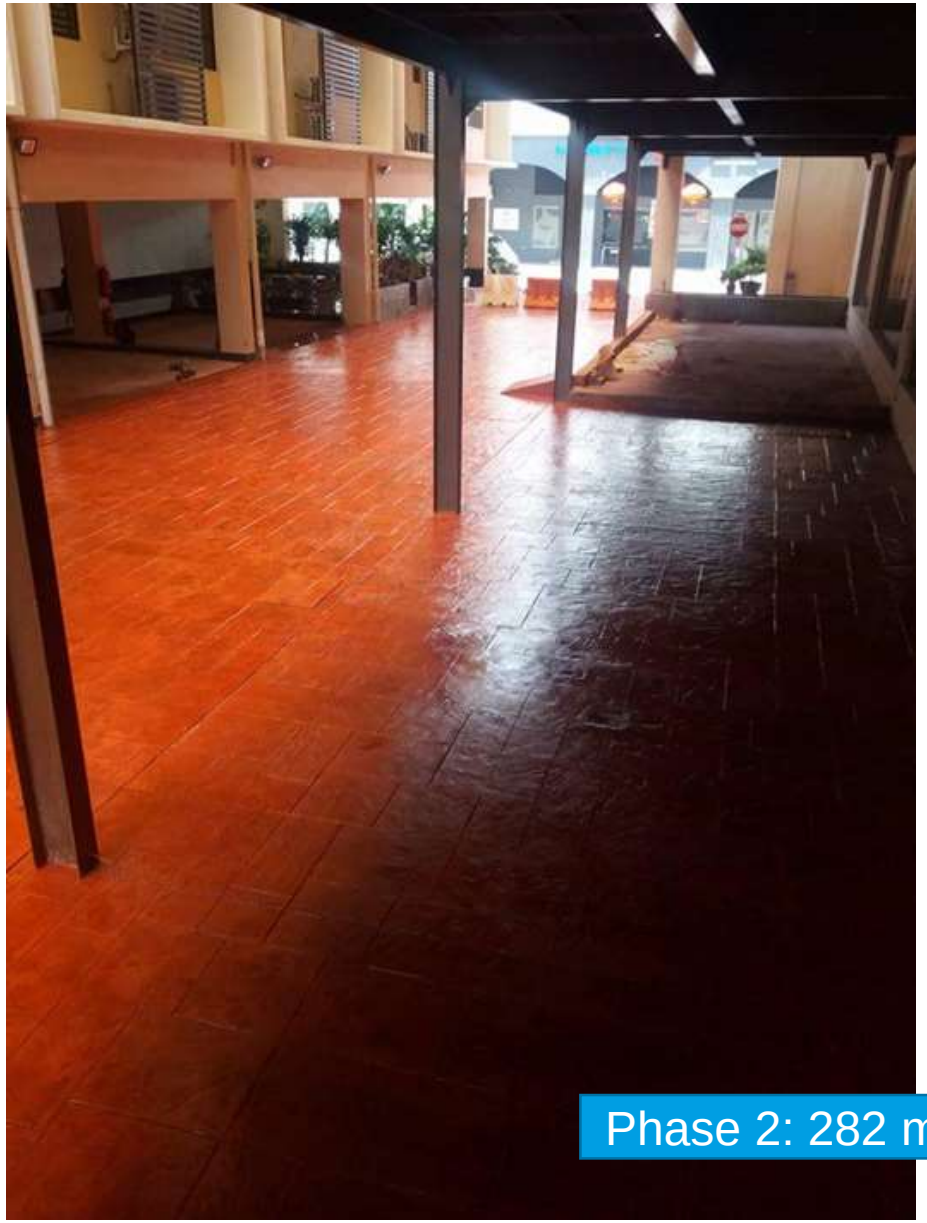
DRIVE WAY - LA BOSS HOTEL IN MELAKA – STAMPED CONCRETE

Phase 1: 136.8m2



Phase 2: 282 m2

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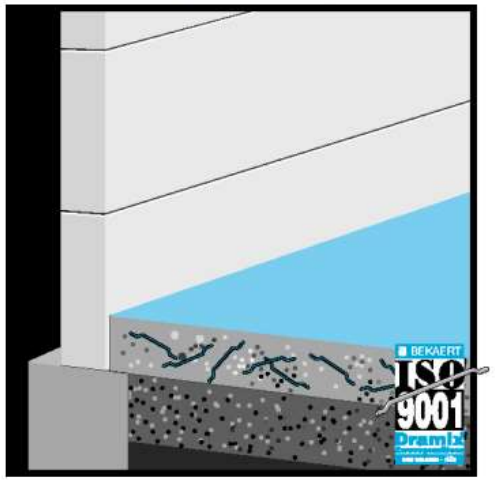
ANGSANA MALL DRIVEWAY IN JOHOR BAHRU – CONCRETE IMPRINT

Total Area : 946m2

Dramix®



Design of ground supported steelfiber reinforced floors based on the Losberg Yield Line model

Design made for : Lafarge
Project : Angsana Mall Johor
Project Segment : Driveway

Dramix ® Solution	
Floor thickness :	180 mm
Dosage :	15.00 kg/m³
Fiber type :	3D 80/60BG
$R_{e,3}$ value :	41.86%
Equivalent flexural strength ($F_{fct,eq,150}$) :	1.80 N/mm²
Max joint spacing :	6000.00 mm * 6000.00 mm

SUMMARY Grade 30 Pump Artevia Imprint
Specified Spreac 100+/-25 mm

Batch Weights (SSD) for one cubic metre of concrete

Cementitious		330.0	kg/M3
Water		170.0	kg/M3
Fine Aggregate	(Sand)	891.0	kg/M3
Coarse Aggregate	(20mm)	950.0	kg/M3
Admixture : Water Reducer		0.726	Litre/M3
: Superplasticizer		2.310	Litre/M3
: Steel Fibre	(Dramix 80/60)	15.00	kg/M3

Mix Code : 3021ZL0004
Note :
1) Artevia Imprint with Steel Fibre (Dramix 80/60)

G30 Stamped Concrete, with 15kg 3D-Steel Fiber
Texture: European Fan, Color: Earth

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Road Barier

Tauren Barriers – New Zaeland

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Road Barriers – Italy

Barier rel kereta - Perancis

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Dinding precast - India

Port Pavement

CONTAINER YARD TELUK LAMONG, SURABAYA

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Port of Paranagua

- Container Terminal
- Brazil
- 2002
- 2,690,977 ft^2 (250,000 m^2)
- 3D 80/60BG

Concrete pavement

Port of Algeciras

- Maersk Container Terminal (construction in sea)
- Spain
- 1995-2011
- 3,767,368 ft^2 (350,000 m^2)
- 3D 80/60BG

Concrete pavement

Precast


Dramix
INSIDE

Precast Stairs – Pruksa Thailand

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Wika Beton - Indonesia

BEKAERT
better together

Piles Head – Batam, Indonesia

BEKAERT
better together

SIMAT

- France
- Since 1995
- 3D 80/60GG

Pipes

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Underground Applications

Riva Tunnel

- Tunnel
- Turkey
- 2015
- 5D 65/60BG

Final lining

Lee Tunnel London

- Tunnel (Ø: 8.8 m)
- UK
- 2015
- 5D 65/60BG

Final lining

- 3D 65/35 BG for the shaft lining

Channel Tunnel Rail Link

- Tunnel (Ø: 7.5 m)
- UK
- 2003-2004
- 3D 80/60BG

Segmental lining

Thank you!

www.bekaert.com/
dramix

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