



# **Sustainable Road Construction: Advancements in Cement Product as Key Enabler**

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10th Business Forum  
Road Engineering Association Of Asia and Australasia

**Labuan Bajo, August 2023**

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# THE CHALLENGES OF TODAY'S ROAD INFRASTRUCTURE



Building a good city requires good infrastructure.



The road network in Indonesia is a vital public infrastructure that connects all parts.



The construction industry is currently facing many problems and challenges

The following are some of the challenges in Indonesia's road infrastructure development:



Poor Pavement Structure



Unstable Material Quality



Unstable Soil



Road Structure Complexity Increases



Vulnerable To Flooding



Environmental Impact of Construction



Inconvenience During Maintenance And Repair Work



Inconsistent Work Results

..... as a material supplier, SIG will be an integrated solution provider to overcome the problems and challenges of road construction in Indonesia.





# SIG PROFILE & COMMITMENT

## 2020 We Are Now the Solution Provider

SIG aims to be at the forefront of providing innovative, applicable and value-added building material solutions in the region.

<b>National Distribution Coverage</b>	9 integrated plants, 6 grinding plants and 30 Packing plants spread from Sabang to Merauke.
<b>43 % Capacity Share</b>	70% utilization. 76% green cement production.
<b>Diverse &amp; Green Label Product</b>	Complete diversification of cement, mortar and concrete products based on construction uses  Green label product with lower carbon emission: PwrPro, EzPro, DuPro+ LH, DuPro+ SBC, Maxstrength
<b>Footprint PSN</b>	YTD 2022 SIG has contributed to 148 National Strategic Project (PSNs) and we are committed to do more.
<b>Domestic Component Level (TKDN)</b>	Cement Product TKDN value of up to 98.6%*.  *Certified by Sucofindo

**50%**  
2021 National market share

**51%**  
Government Shares

Balikpapan - Samarinda Toll  
East Kalimantan



Mandalika Circuit



Patimban Port



SABO DAM Merapi



# Network and Distribution

## GP Grinding Plants

**Dumai Riau**  
1 unit  
Cement Mill

**Palembang South Sumatra**  
1 unit  
Cement Mill

**Bandar Lampung Lampung**  
1 unit  
Cement Mill

**Cigading West Java**  
1 unit  
Cement Mill

**Gresik East Java**  
1 unit  
Cement Mill

**Ho Chi Minh Vietnam**  
1 unit  
Cement Mill

## PP Packing Plants

**In 30 locations**  
Sumatra, Java, Kalimantan, Sulawesi, Bali, Maluku, and Papua

## Port

**Dumai** 30.000 DWT  
**Teluk Bayur** 40.000 DWT  
**Palembang** 8.500 DWT  
**Cilacap** 40.000 DWT  
**Taban** 40.000 DWT  
**Gresik** 20.000 DWT  
**Biringkassi** 40.000 DWT  
**Quang Ninh** 20.000 DWT  
**Ho Chi Minh** 15.000 DWT

## ICP Integrated Cement Plant

**Lhoknga Aceh**  
1 Cement Kiln and  
2 Cement Mills

Capacity  
**1.8** Million tons  
per year

**Indarung West Sumatra**  
5 Cement Kilns and  
8 Cement Mill

Capacity  
**8.9** Million tons  
per year

**Baturaja South Sumatra**  
2 Cement Kilns and  
4 Cement Mill

Capacity  
**3.85** Million tons  
per year

**Narogong West Java**  
2 Cement Kilns and  
6 Cement Mill

Capacity  
**6** Million tons  
per year

**Cilacap Central Java**  
1 Cement Kilns and  
2 Cement Mill

Capacity  
**3.4** Million tons  
per year

**Rembang Central Java**  
1 Cement Kilns and  
2 Cement Mill

Capacity  
**3** Million tons  
per year

**Taban East Java**  
6 Cement Kilns and  
11 Cement Mill

SIG Capacity  
**15** Million tons  
per year

Kapasitas SBI  
**3.6** Million tons  
per year

**Tonasa South Sulawesi**  
4 Cement Kilns and  
6 Cement Mill

Capacity  
**7.4** Million tons  
per year

**Quang Ninh Vietnam**  
1 Cement Kilns and  
2 Cement Mill

Capacity  
**2.3** Million tons  
per tahun





# SIG'S COMMITMENT TO SUSTAINABLE LIVING

## INTEGRATING SUSTAINABILITY STRATEGY

### DRIVING SUSTAINABLE SOLUTIONS AND INNOVATION

#### Promote sustainable products and solutions



49% proportion of sustainable products and integrated services solutions to total revenue

#### Sustainable procurement



75% long-term contract value to total purchases (goods/services)



100% of active contractors screened via CSMA

### PROTECTING THE ENVIRONMENT

#### Climate and Energy



27% scope 1 GHG emissions reduction from 2010 baseline

#### Air emissions



25% dust emissions reduction from 2019 baseline

#### Biodiversity



100% biodiversity management plans implementation

#### Water management



11.46% reduction of specific freshwater withdrawal (L/tonne cement eq.) from 2019 baseline

#### Circular economy



1.87 million tonnes alternative raw material



0.9 million tonnes of alternative fuel

### CREATING VALUE FOR PEOPLE AND COMMUNITY

#### Community development



8.6 million beneficiaries cumulative since 2015

#### Ethics and compliance



100% compliance on code of Conduct

#### Occupational health and safety



0 fatality



0.33 Lost time injury frequency rate (LTIFR)

#### Employment



Availability of top talent with global leader quality



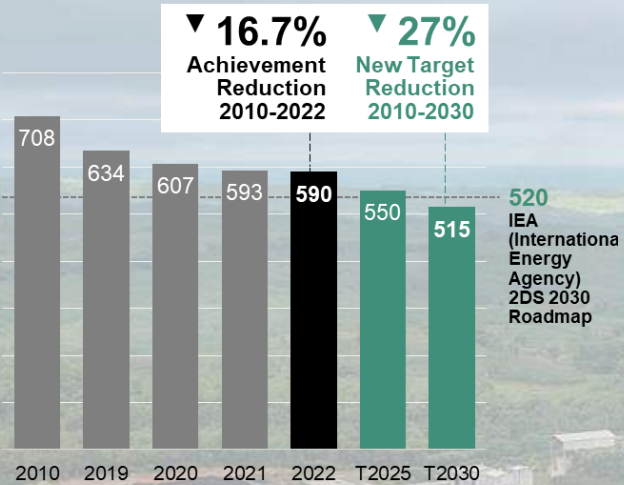


# SIG'S COMMITMENT TO SUSTAINABLE LIVING

## DECARBONISATION EFFORT

### CO<sub>2</sub> Emission Intensity, Scope 1 – From Internal Process (KgCO<sub>2</sub>/Ton cement eq.)

Decarbonisation Initiatives related to GHG Reduction - Scope 1



**Increasing Alternative Fuel & Raw Material (AFR) Use**

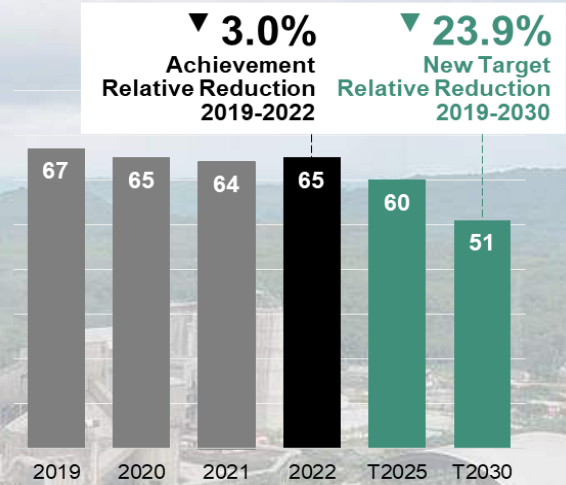
**Optimising Specific Thermal Energy Consumption (STEC)**

**Producing Excellence Products**

- ▶ Substitution of extractive material with non extractive material
- ▶ Collaboration with PENTAHHELIX scheme to optimise the use of the green products and solution

### CO<sub>2</sub> Emission Intensity, Scope 2 – From Indirect Use of Electricity (KgCO<sub>2</sub>/Ton cement eq.)

Decarbonisation Initiatives related to GHG Reduction - Scope 2



**Optimising Renewable Energy Supply**

- ▶ Solar Panel installation via Partnership with local provider—Scheduled to scale up by 7.5 MWp in 2023 with target 572 MWp in 2030
- ▶ Solar Panel will be installed in all plant across Indonesia (SIG Tuban, SBI, SP, ST, SG, SMBR and IKSG)
- ▶ Other renewable initiatives such as optimise use of existing waste heat recovery power generator (WHRPG) with 29.5 MW installed capacity





# SIG'S COMMITMENT TO SUSTAINABLE LIVING

## DECARBONISATION EFFORT

### ADVANTAGES

#### ECONOMIC BENEFITS

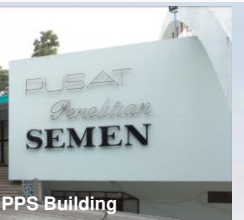
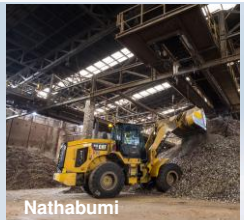
- Potential savings of 5-15% on cement costs
- Efficient repair costs due to durability

#### TECHNICAL BENEFITS

- Allows for a more precise and accurate selection of cement according to requirements and environmental conditions
- Compressive strength growth continues even after 28 days of age
- Better durability, so the life of the structure can be extended
- Consistency of product quality is more controllable compared to manually adding a third material when making concrete in the field.
- Have the ability to achieve much higher final compressive strength, so there is potential for slimmer structural dimensions.

#### ENVIRONMENTAL BENEFITS

- Contribute to government programs to reduce CO<sub>2</sub> emissions
- Support the use of waste materials from other industries (fly ash & GBFS)
- Supporting the implementation of green infrastructure programs



Production Excellence

Lean Manufacturing (Eliminate Waste)

Advance Process Control

Utilisation of AFR (Non Extractive Material)

Sustainable Supply Chain

Applied Research & Innovation

Technology Digitalisation

Renewable Energy

### BULK CEMENT



PWRPRO

SNI 8912:2020 (HE)

- ▶ Cast in situ & precast concrete (wet & semi dry) applications, and the drymix industry.
- ▶ Higher initial compressive strength & 5-10% faster initial setting time\*
- ▶ 12% lower hydration heat\*
- ▶ 8% lower emissions\*
- ▶ TKDN: 96.99%



MAXSTRENGTH

SNI 8363:2017

- ▶ High rise building, fly over and tunnel construction applications
- ▶ 25% lower hydration heat\*
- ▶ Permeability is 19% better\*
- ▶ Sulfate resistance is 92%\*
- ▶ Chloride resistance is 85%\*
- ▶ 16% lower emissions\*
- ▶ TKDN: 89.98%



EZPRO

SNI 7064:2014

- ▶ General concrete applications (roads, drainage, housing), embankments, soil stabilisation.
- ▶ High adhesion 24% lower hydration heat\*
- ▶ 28% lower emission\*
- ▶ Strong & smooth finish
- ▶ TKDN: 96.95%



DUPRO+ LH

SNI 0302:2014 (IP-U)

- ▶ Construction applications in marine waters, power plants, smelters, waste water lines
- ▶ 11% lower hydration heat\*
- ▶ Permeability is 20%\*
- ▶ Sulfate resistance is 72%\*



DUPRO+ SBC

SNI 0302:2014 (IP-K)

- ▶ DUPRO+ LH: 16% lower emissions\*
- ▶ DUPRO+ SBC: 22% lower emissions\*
- ▶ TKDN: 91.39%

### MULTIPURPOSE CEMENT



SNI 3758-2004



SNI 7064:2014

- ▶ Affordable prices and guaranteed quality
- ▶ Mix fluffier and dry time just right
- ▶ Better adhesion
- ▶ Minimal cracking and peeling
- ▶ 37% lower emission\*
- ▶ Easier to work with, and more watertight
- ▶ Lower temperature of concrete so it doesn't crack easily
- ▶ Higher concrete strength without additional additives
- ▶ Concrete dries 30% faster
- ▶ Concrete is 15% stronger
- ▶ 8% lower emissions\*













SNI 7064:2014

- ▶ better adhesion, easier to work with, and more watertight
- ▶ Lower temperature of concrete so it doesn't crack easily
- ▶ the end result is stronger and the surface is smoother
- ▶ masonry work (parting, plastering, plastering)
- ▶ environmentally friendly cement
- ▶ 28% lower emissions\*

# ORDINARY PORTLAND CEMENT


## SIG PRODUCT & SOLUTION

UltraPro	SprintPro	DuPro+ HSR	DuPro+ MSR	SuperTermo
SNI 2049-2015 - Tipe I	SNI 2049-2015 - Tipe I	SNI 2049-2015 - Tipe V	SNI 2049-2015 – Tipe II	API Spec 10A Class G-HSR
				
<ul style="list-style-type: none"> <li>• High early and late strength</li> <li>• Optimal Dry Time</li> <li>• Better Flexural Strength</li> <li>• Sturdy Final Results</li> <li>• Cement based Soil stabilization</li> </ul>	<ul style="list-style-type: none"> <li>• Higher early Compressive Strength</li> <li>• Optimum Hydration Process and Maintained</li> <li>• High Productivity</li> <li>• The End Result Is Not Easy to Crack</li> <li>• Cement based Soil stabilization</li> </ul>	<ul style="list-style-type: none"> <li>• High sulphate resistance</li> <li>• Moderate chloride resistance</li> <li>• Better permeability of concrete</li> <li>• Higher and longer lasting initial &amp; final press tips</li> </ul>	<ul style="list-style-type: none"> <li>• The resistance to sulfates and chlorides is moderate</li> <li>• Better permeability of concrete</li> <li>• Higher initial &amp; final compressive strength and long lasting</li> </ul>	<ul style="list-style-type: none"> <li>• Consistent Quality and Response to Additives</li> <li>• Sulfate Resistance and Stable Performance At High Pressure</li> <li>• Cement Rheology According to Application</li> </ul>
 <p>Jakarta International Stadium</p>	 <p>Thamrin 9</p>	 <p>PLTU Paiton, Probolinggo</p>	 <p>PLTU Grati, Surabaya</p>	 <p>PLTP Sarulla</p>



# ROAD RESEARCH & DEVELOPMENT COLLABORATION TO MEET FUTURE BUSINESS CHALLENGES

**Porous Concrete Application on the Road Material Technology Application Trial Project (mini circuit)**

 Directorate of Road and Bridge Engineering, Directorate General of Highways, Ministry of Public Work




**Development of an environmentally friendly geopolymer based on fly ash as a non-shrinking grout**

 University of Indonesia (UI)




Geopolymer shrink non grout SIG - UI

**Porous Concrete Application on the glass bridge project, National Tourism Strategic Area (KSPN) Bromo-Tenger-Semeru, East Java**

 East Java Regional Residential Infrastructure Centre, Directorate General of Human Settlements, Ministry of Public Work




**Self Healing Concrete for Prevention and Repair of Concrete Cracks**

 National Research and Innovation Agency (BRIN)




The Silo Curative Microbial Healing  
Self Healing Concrete SIG - BRIN  
The forming calcite-carbonate

**Development of high performance concrete using hydraulic cement (SNI 8912:2020)**

 National Research and Innovation Agency (BRIN) and Chemical Additive Manufacturer




**Rapid Strength Concrete (RSC) Rigid Pavement as an environmentally friendly road construction solution based on a case study of national road repair in the Duduk Sampeyan - Lamongan area.**

 East Java-Bali National Road Implementation Centre, Directorate General of Highways, Ministry of Public Work



Rapid Strength Concrete  
Source : kabaraktual.id, ubaya.ac.id, crownoil.co.uk

**Development of Soil stabilization**

 Taiheiy Cement Corporation (TCC)



**Soil Stabilization SIG - TCC**

# RESEARCH AND DEVELOPMENT CAPABILITY

## RESEARCH FACILITIES

### R&D SIG Holding

- Physical laboratory
- Chemical Laboratory (Instruments)
- Chemical Laboratory (Wet)
- Concrete and Bulding Materials Laboratory
- Soil Laboratory

### Research Center Narogong

- Cement Laboratory
- Concrete Laboratory
- Housing and Building Materials Laboratory
- Soil Laboratory

### Laboratory of Concrete Subsidiary

- Concrete Laboratory

### Laboratory of Cement Subsidiary

- Cement Laboratory

## PARTNERSHIP AND COLLABORATION

Universities

External Laboratory and Research Institution

Chemical Products Companies

Construction Companies

Consultant Companies

Government and Association

## FIELD OF R&D

Raw and Alternative Materials

Cement Products

Cement Derivative Products

Packaging

Spareparts

Application Test

## QUALIFICATIONS AND CERTIFICATIONS

### QUALIFICATIONS

Chemical Engineer, Civil Engineer, Material Engineer, Mechanical Engineer, Chemist, Analyst

### CERTIFICATIONS

International and Domestic

## OUTPUT RESULTS OF RESEARCH

(2017 – 2022)

Product Development  
**77**

Process Development  
**16**

Material & Application Test  
**27**

X-Ray Diffraction, XRD



X-Ray Fluorescence, XRF



Bomb Calorimeter



Heat of Hydration Calorimeter

UV Spectrophotometer



Abrasion Testing Machine



Roller Screenshot

Paving Machine



Vertical Mill



Compression Testing Machine 2000 kN Capacity



Mini Ball Mill





# ENVIRONMENTAL FRIENDLY SOLUTIONS FOR SUSTAINABLE ROAD INFRASTRUCTURE

## SIG PRODUCT & SOLUTION

### RAPID STRENGTH CONCRETE (SpeedCrete)

As an effort to minimising road traffic issues and reducing CO<sub>2</sub> emissions, PT Semen Indonesia (Persero) Tbk (SIG) as a leading multinational building material solution company has presented Rapid Strength Concrete (RSC) as one of the solutions to the problem of reducing the duration of concrete pavement. Fast track pavement concrete solution with guaranteed open traffic 3-12 hours after concrete finishing and maintenance period. SpeedCrete has proven to be effective in reducing congestion caused by road repairs in high traffic areas.

#### PARTNER

- Direktorat General of Highways - East Java & Central Java, Ministry of Public Work
- Direktorat General of Human Settlements - Central Java, Ministry of Public Work
- Cement Indonesia International University (UISI)
- Diponegoro University

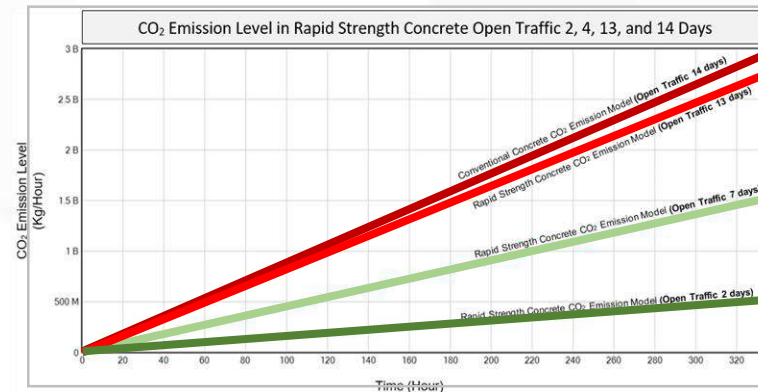
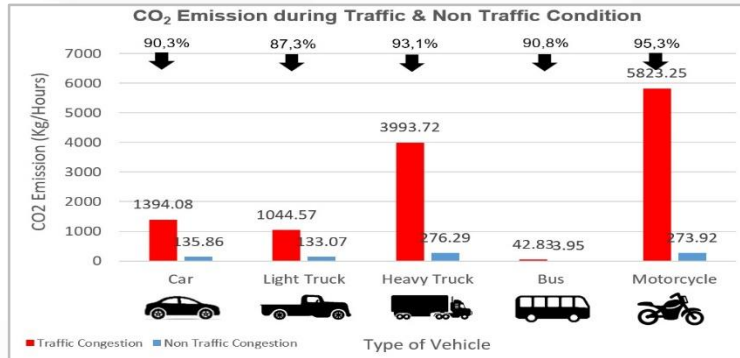


#### STANDARD

- SNI 2847-2013
- ACI 318
- AASHTO T 140
- ASTM C 116

#### APPLICATION

- Harbor
- Arterial road
- Busway
- Toll road



Source: Analysis Results, 2023

Total CO<sub>2</sub> Emission (Idle) : 12,3 Ton/Hrs.  
Total CO<sub>2</sub> Emission (Active) : 0,82 Ton/Hrs.

- The total reduction in CO<sub>2</sub> emissions by all types of vehicles when traffic returns to normal is 98.3%.
- This research demonstrates that the use of RSC in road construction reduces carbon emissions and traffic congestion.

#### Loss of Fuel Consumption due to Traffic Congestion

Type Vehicle	Units	Average Cost Loss		
		Average Cost Loss For Each Vehicle in Non-Traffic Congestion	Average Cost Loss For Each Vehicle in Traffic Congestion	Average Cost Loss For Each Vehicle
Car	197	Rp232,263.00	Rp5,048,125.00	Rp4,815,862.00
Small Truck	122	Rp229,360.00	Rp4,445,924.00	Rp4,216,564.00
Big Truck	247	Rp474,240.00	Rp12,308,751.00	Rp11,834,511.00
Bus	4	Rp6,756.00	Rp146,448.00	Rp139,692.00
Motorcycle	1988	Rp528,808.00	Rp26,337,024.00	Rp25,808,216.00

The total cost lost due to loss of vehicle fuel consumption is Rp 46.814.845,-

Source: Analysis Results, 2023

### BEST PRACTICE



#### Advantages

- Total Solution
- Minimize congestion
- Sustainable Construction
- Added Value & Total Cost Ownership
- 24 hour batching plant network

Guaranteed to be passed by vehicles at specified hours mentioning in the table:

SOLUTION PACKAGE	PERFORMANCE CRITERIA
SpeedCrete 3 hours	Setting time 3 hours
SpeedCrete 4 hours	Setting time 4 hours
SpeedCrete 8 hours	Setting time 8 hours
SpeedCrete 12 hours	Setting time 12 hours

### POROUS CONCRETE

One of the innovative construction materials that is environmentally friendly because it can absorb surface water into the ground

### PARTNER

East Java Regional Residential Infrastructure Centre, Directorate General of Human Settlements, Ministry of Public Work



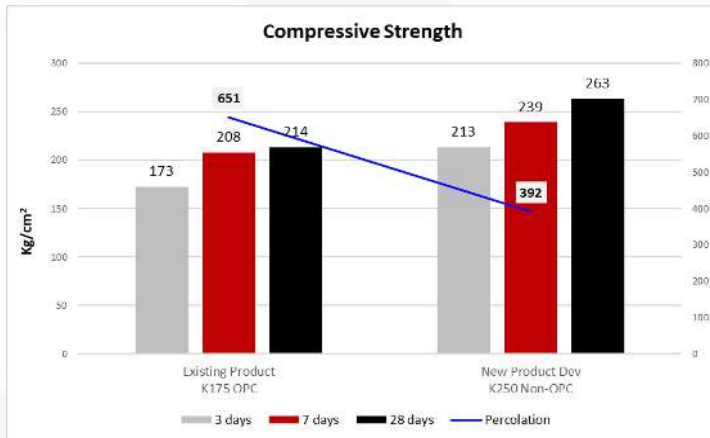
### STANDARD

- ACI 522
- ACI 330R-01
- Special specifications for porous concrete pavement SKh-1.5.14 Directorate General of Highways 2022

### TECHNICAL PROPERTIES

- Dimensions : 21 x 10,5 cm (H6 and H8)
- Colour : green, red, natural
- Void : min 20%
- Strength : up to K250
- Percolation : 81-730 lt/mnt/m<sup>2</sup>

### PAVING POROUS BY VUB



Source: Analysis Results, 2023

### RESEARCH GOALS:

1. Showcase paving porous at national tourism strategic area Bromo-Tengger-Semeru (area of 457 m<sup>2</sup>).

There is no such application yet in the construction work of the East Java Regional Residential Infrastructure Center. **This application will be the first time.**

2. Product novelty: higher target compressive strength than existing product (K250) using PwrPro (SNI 8912:2020 (HE)).

### BEST PRACTICE





### POROUS CONCRETE

One of the innovative construction materials that is environmentally friendly because it can absorb surface water into the ground

### PARTNER

Directorate of Road and Bridge Engineering Development, Directorate General of Highways, Ministry of Public Work



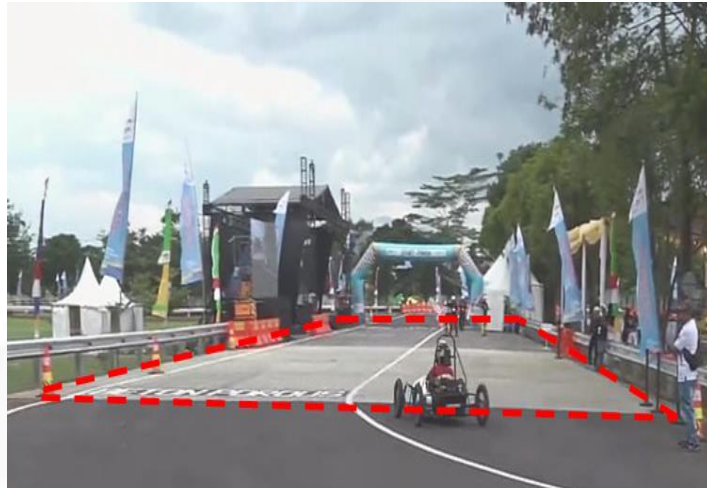
### STANDARD

- ACI 522
- ACI 330R-01
- Special specifications for porous concrete pavement SKh-1.5.14 Directorate General of Highways 2022

### TECHNICAL PROPERTIES

- Ready mix concrete
- Colour : red, dark grey, natural
- Void : min 20%
- Strength : up to 20 MPa
- Percolation :  $\pm 250$  lt/mnt/m<sup>2</sup>

### THRUCRETE BY SBB



### RESEARCH GOALS:

1. Support in order to improve the Special specifications for porous concrete pavement.
2. Showcase on the agenda: Exhibition of Electric Vehicles in the Context of Road Day 2022

- Porous Concrete has been applied with an area of 595 m<sup>2</sup> for 6 days.
- All requirements for acceptance according to the special specifications for porous concrete pavement SKh-1.5.14 of the Director General of Highways 2022 have been fulfilled.

### BEST PRACTICE



### PARTNER

Taiheiyō Cement Corporation (TCC)

### SOIL STABILIZATION

Our solution is a breakthrough soft soil problem by using cement based stabilizer agent. After applying the solution, the soil becomes impermeable, obtains high UCS and improves road durability.

### STANDARD

- SNI 8460-2017
- ASTM D 2216-98
- ASTM D 698-00a
- SNI 03-3638-1994
- SNI 03-1744-1989

### INDONESIAN SOFT SOIL & PEAT

<p>Peat Soil</p>	<p>Expanded</p> <p>Wet      Dry</p>
<p>Marine Clay マリンクレイ</p>	<p>Shale Clay 粘土質頁岩</p> <p>Wet      Dry</p>
<p>Powder Type</p>	<p>Slurry Type</p>

- Soft soil land in Indonesia deposit reaches 20 M hectare or 10% of total land area.
- The ground varies from area to area with different types, such as **Peat soil, Shale clay, Marine clay, Expanded soil, etc.**, and **We can harden almost all type of soft soil.**
- However, it is important to use stabilizer agents and construction methods that are appropriate for each type of soil.
- As for the construction of Road, the durability of roads can be improved if solidifying the soft soil ground foundations properly.

### One of the projects in Japan by CDM method (TCC Group)



### BEST PRACTICE

Onoda Chemico (Taiheiyō Cement Group) was appointed to conduct Soft soil improvement work at the river bank for stabilizing the railway bridge in the Yogyakarta railway double tracking project.



Mock-up test for mine haul road

Stabilizer agent was **customized** for the project. The solution was developed by SBI&PLP (SIG Group) and TCC Group.



# ENVIRONMENTAL FRIENDLY SOLUTIONS FOR SUSTAINABLE ROAD INFRASTRUCTURE

## SIG PRODUCT & SOLUTION

### HIGH PERFORMANCE CONCRETE USING HYDRAULIC CEMENT (SNI 8912:2020)

According to Civil Engineering Research Foundation (CERP), HPC is concrete that has some or all of the following characteristics high/special : ease of placement, long term mechanical properties, early age strength, toughness, volume stability, extended service life in severe environments.

### PARTNER

National Research and Innovation Agency (BRIN)



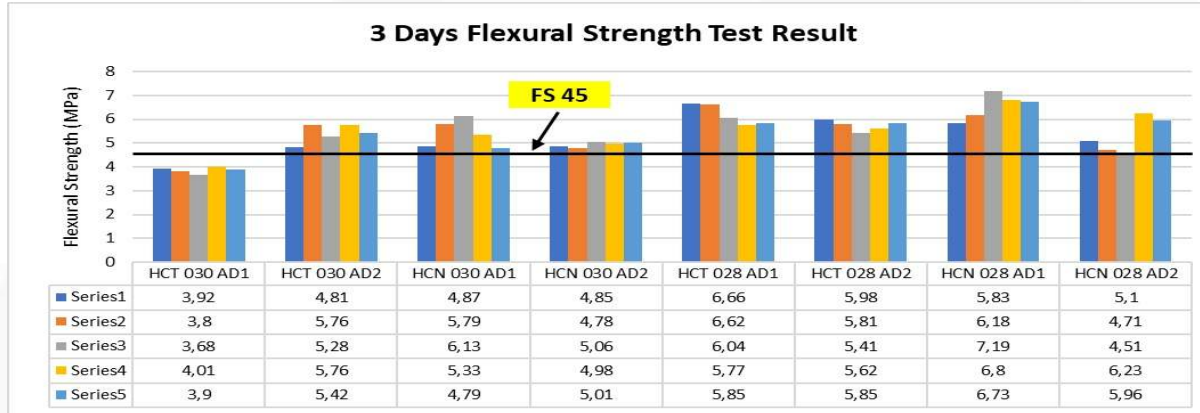
### Minimum flexural strength for concrete pavements

Description	Standard	Flexural Strength
Flexural strength at 28 days for concrete trial mix	SNI 4431:2011	47 (kg/cm <sup>2</sup> ) FS 47
Flexural strength at 28 days for concrete pavements (production control)	SNI 4431:2011	45 (kg/cm <sup>2</sup> ) FS 45

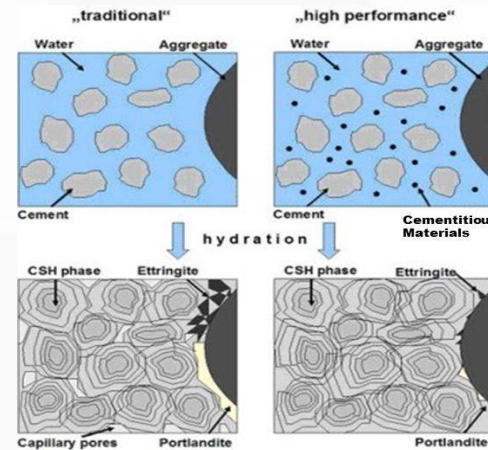
Source: Directorate of Road and Bridge Engineering Development, Ministry of Public Work, Dec 2012

### RESEARCH GOALS:

Development of High Performance Concrete using Hydraulic Cement so that performance is obtained in accordance with the quality requirements of SIG concrete subsidiaries with the quality criteria of FS 45 (3 days achieved 100%) for rigid pavement applications.



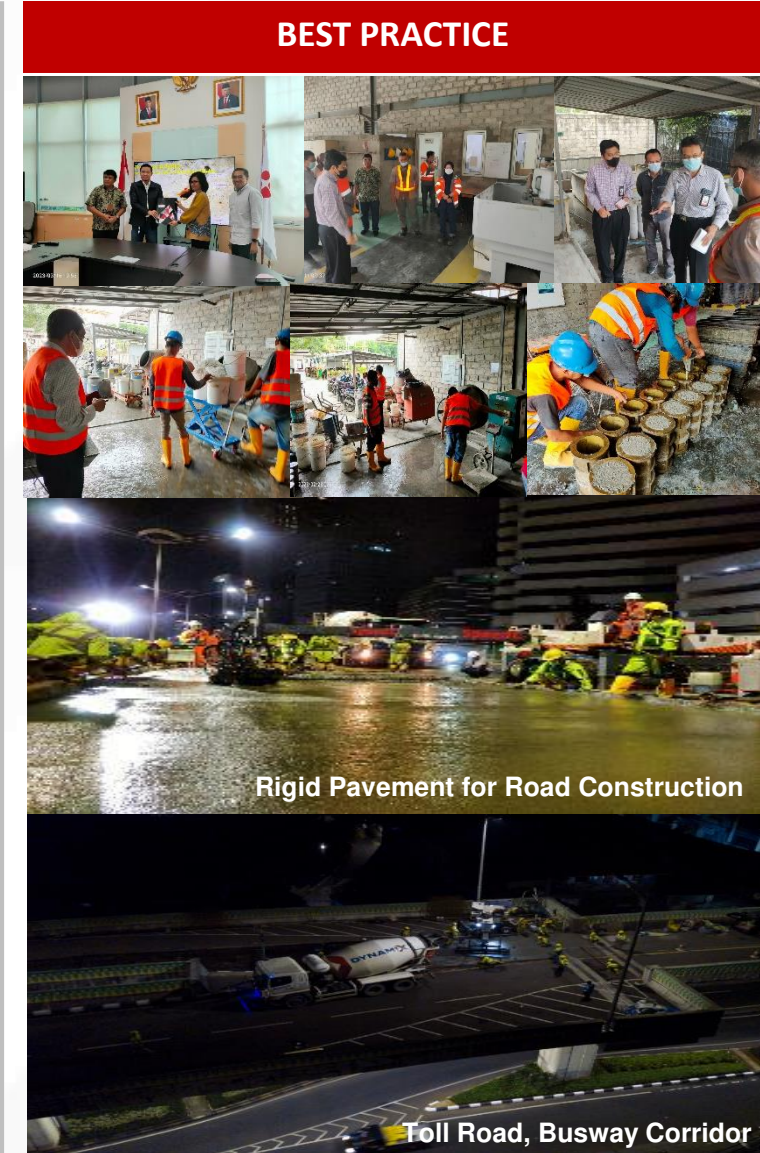
Based on the data from the research conducted, it was obtained the results of a concrete mix design using hydraulic cement which has high performance (optimal) and meets the Strength and Workability indicators.



Hydration of Normal Concrete versus High Performance Concrete

**Collaboration between SIG – BRIN**  
HPC = fast track, in the age of 3 days can be achieved FS 45 using Hydraulic Cement

### BEST PRACTICE



Rigid Pavement for Road Construction

Toll Road, Busway Corridor

**READYMIX CONCRETE**

Name	Phone Number
Rizko	0812-8879-4633
Destynia (Telesales)	0813-1655-1029
Ifah (Telesales)	0878-8336-0292

**BULK CEMENT**

Name	Phone Number
Dwi Andi Mahendra	0811-3385-586
Rendra Jakadilaga	0811-3335-3695
Taufan Maulana	0811-3486-885

**CUSTOMER CARE SIG**

Toll Free	Email
0800-10-88888	cs@sig.id



SCAN HERE



PRODUCT CATALOG





**THANK YOU**

**PT Semen Indonesia (Persero) Tbk.**  
South Quarter Tower A Lt. 19-20  
Jl. RA Kartini Kav. 8, Jakarta Selatan 12430, Indonesia

### SPEEDCRETE

SNI 2847-2013

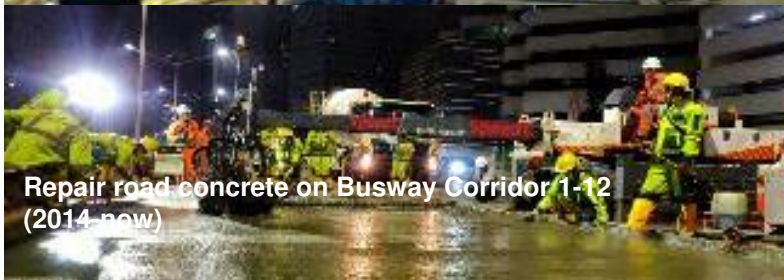
SpeedCrete is one of SIG's innovative solutions – concrete with early strength and high performance, which can dry in hours. With SpeedCrete, repairing roads can be done in one night. SpeedCrete is made using state-of-the-art technology, applied using professional expertise and workmanship, and gives you superior strength and speed. It is proven to be highly effective in decreasing traffic jams while repairing high traffic area roads.



Repair road concrete on Intersection of Jakarta city (2015-now)



Repair road concrete on several toll road such as : Jagorawi, CTC, Japek, Sumo, Surgem (2012 -now)



Repair road concrete on Busway Corridor 1-12 (2014 -now)

### TOPCRETE

TopCrete is a high-performance ultra-thin white topping concrete work solution, has the ability as thin concrete construction, using laser screed & 3D profiler technology application and traffic management services carried out in hours and also can reduce total cost ownership. TopCrete thickness in the range of 7 to 10 cm



Repair road concrete on Busway Corridor 13 elevated (2021-now)

### COMFILPLAS

SNI 2847-2013

ComfilPlas is a mixture of mortar and foam as a lightweight fill material (density in the range of ±600-800kg/m<sup>3</sup>) for road foundations and bridge structure supports that have a light weight, produced by DynaPump a computerized mini batching plant and can pump up to 150 M vertically and 250 M horizontally.



ComfilPlas - Tapal Kuda Fly Over Lenteng Agung (2019)



ComfilPlas - On Off Ramp Toll Road Cakung (2021)