



**CLIMATE-RESILIENT DAMS AND  
HYDROPOWER INFRASTRUCTURE  
INTEGRATING  
ENVIRONMENTAL SUSTAINABILITY  
IN PLANNING AND DEVELOPMENT**

**LOW CARBON CONCRETE: CUT CARBON NOT  
PERFORMANCE**

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# INTRODUCING SIKA LOW CARBON CONCRETE

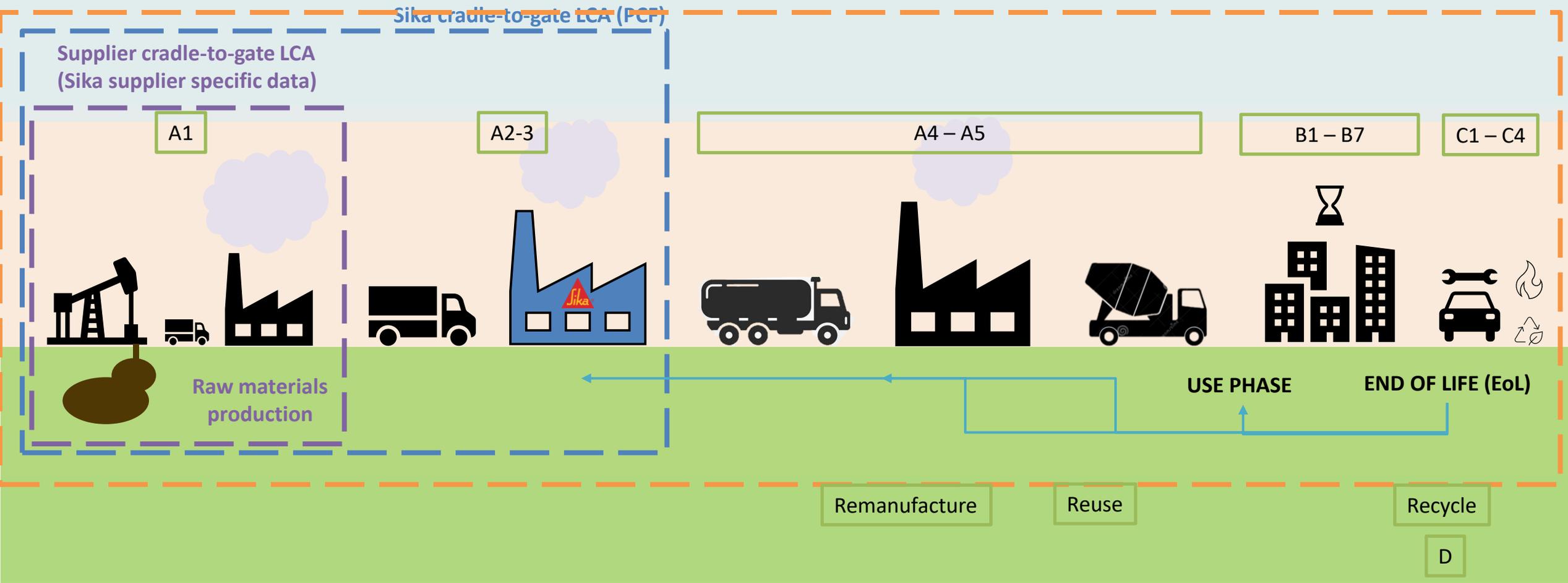
SUSTAINABLE SOLUTIONS FOR A  
GREENER CONSTRUCTION INDUSTRY

“3E” PRINCIPLE: ECONOMIC,  
ERGONOMIC & ENVIRONMENTAL

# The product life cycle – Circular Economy

## different relevant LCA scopes

Supplier, customer and Sika cradle-to-grave LCA



# Sika Low Carbon Concrete

## 3E Concept

### Economic Benefits

Using Sika Low Carbon Concrete offers significant economic advantages through cost savings and increased efficiency in construction projects.



### Ergonomic Advantages

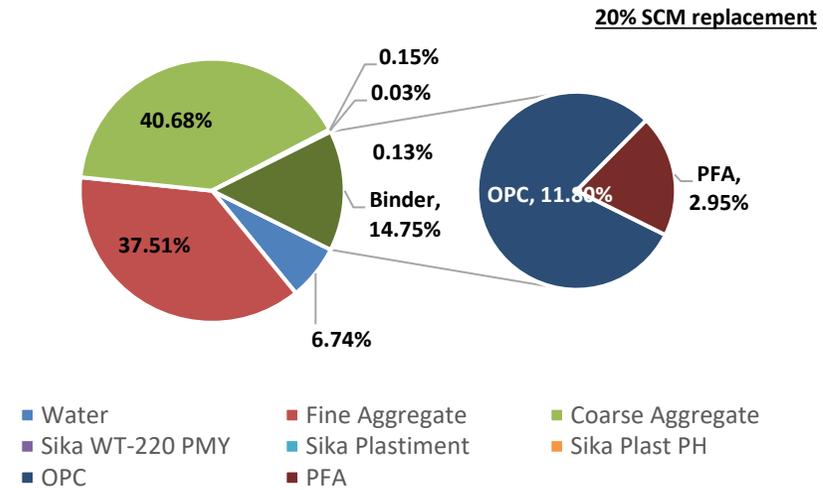
The ergonomic design of Sika Low Carbon Concrete enhances user experience and safety, making it more user-friendly for workers and provides increased efficiency on the project site.

### Environmental Impact

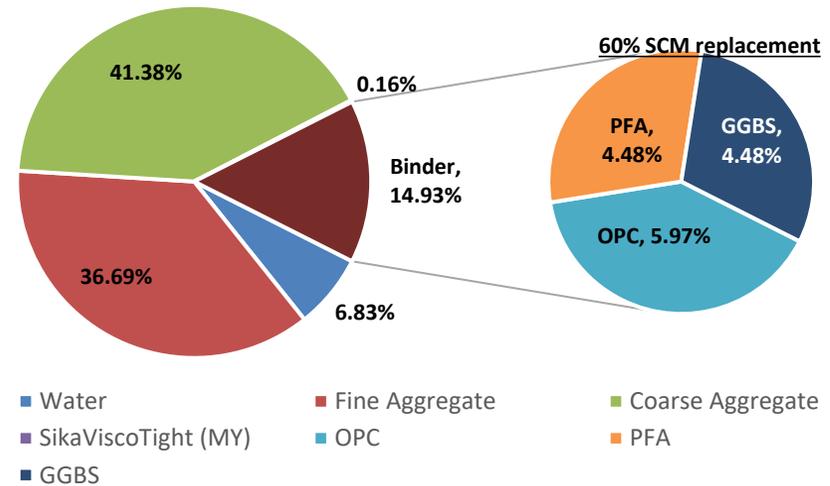
Sika Low Carbon Concrete contributes positively to the environment by reducing carbon emissions and promoting sustainable practices in construction.

Category	Mix	
	50MPa Control (Double blend)	50MPa Optimized (Triple blend)
OPC	280	140
PFA	70	105
GGBS	-	105
Total Binder		350
Water Content		160
w/b ratio		0.46
Fine Aggregate	890	860
Coarse Aggregate	965	970
Sika Plastiment RT 100	0.7L (200ml/100kg)	-
SikaPlast PH 8333 SKY	3.15L (900ml/100kg)	-
Sika WT-220 PMY	3.5kg (1%)	-
Sika ViscoTight (MY)		3.85L (1100ml/100kg)

## Control Mix Design

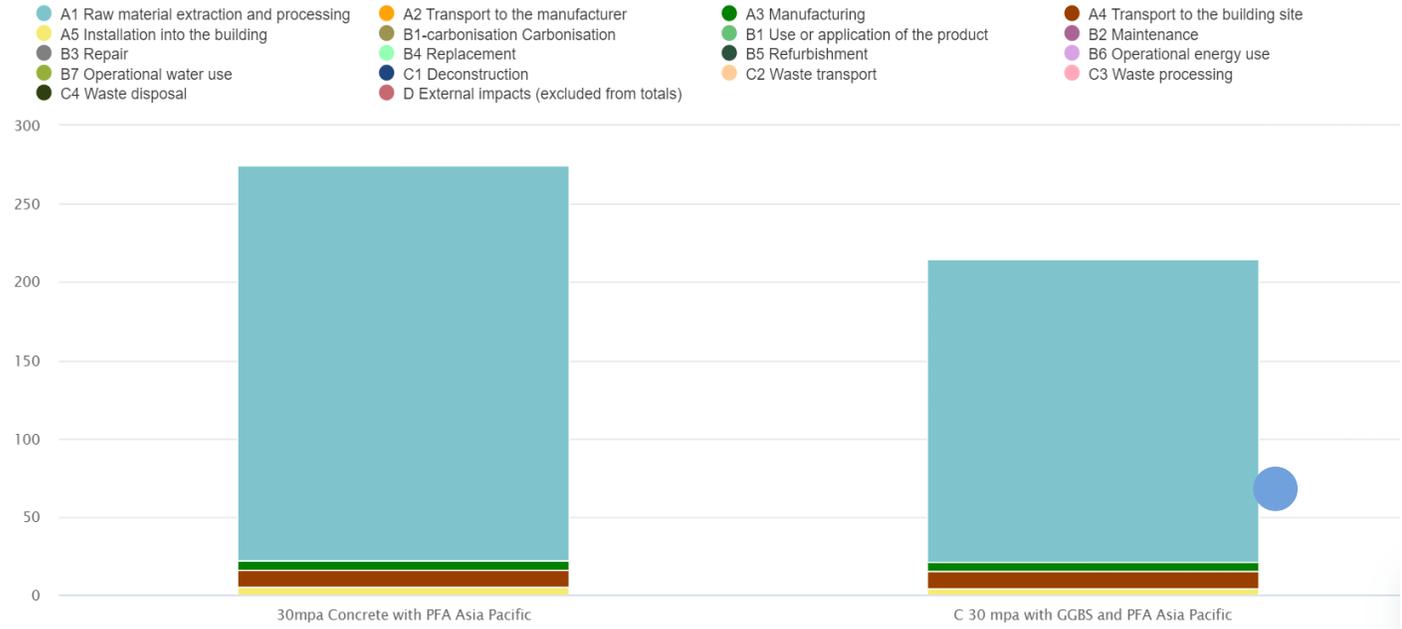


## Optimized Mix Design



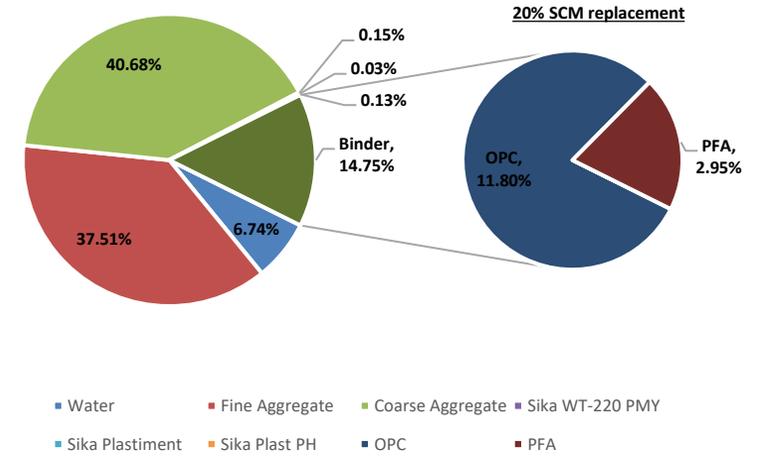
# CO2e – Life-cycle Analysis

EPD Generator for EPD Hub V2 - Global Warming Potential fossil, kg CO<sub>2</sub>e - Life-cycle stages

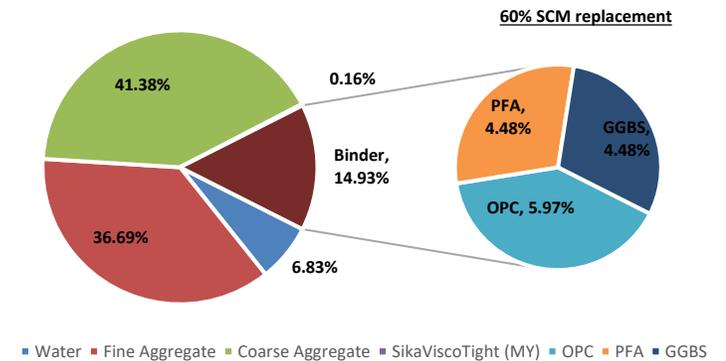


Category	A1. Raw material extraction and processing	A3. Manufacturing	A4. Transport to the building site	A5. Installation into the building	Total
50MPa Control (Double blend)	252.87	6.23	11.12	4.73	274.96
50MPa Optimized (Triple blend)	193.39	6.23	10.98	4.13	214.74
<b>Overall kg CO<sub>2</sub>e / m<sup>3</sup> savings</b>					<b>-60.22, -22%</b>

## Control Mix Design



## Optimized Mix Design



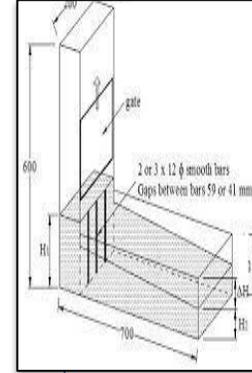
# Low carbon SCC Concrete

Reference to IS 10262- 2019



## How well your concrete pours into formwork

- Filling Ability
  - Slum Flow ( SF1 & SF2)
  - V- Funnel (V2)



## After entering your formwork, how well it passes through rebar

- Passing Ability
- L- Box ( L Box  $\geq 0.8$  )



## After entering your formwork, how well it passes through rebar

Passing Ability



## Once passing through rebar, how stable is it inside the formwork, without any segregation / bleeding

- Segregation resistance (Stability of mix)
- SR1 (15 to 20%)

## MIX DESIGN INFORMATION AT SIKA R&D LABORATORY

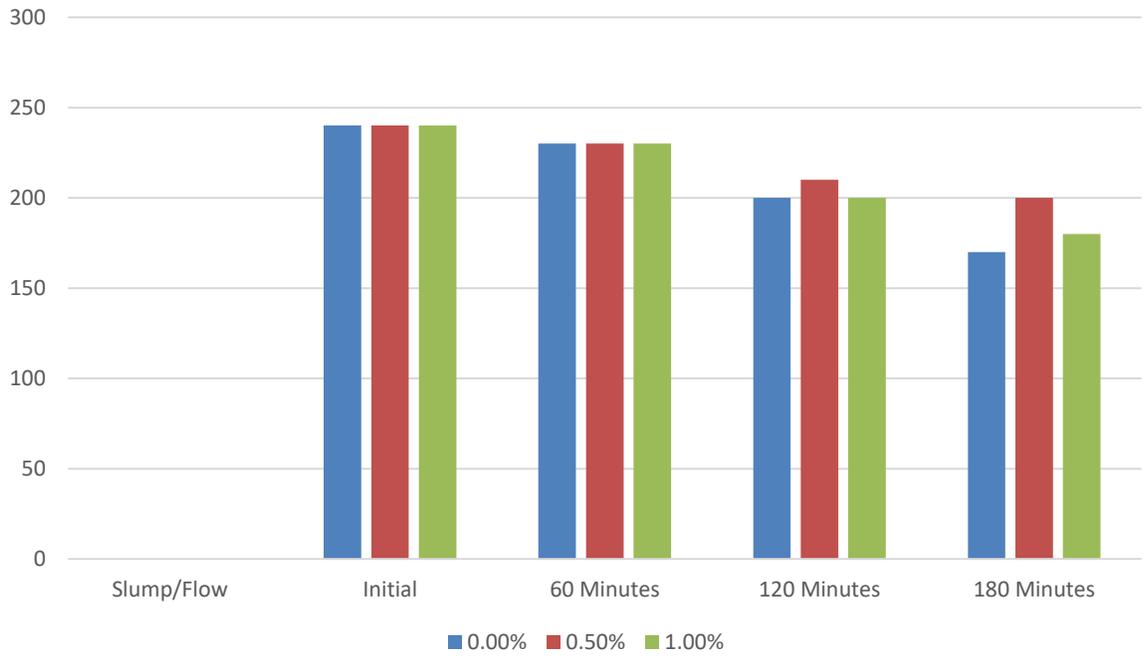
	<b>Specific gravity</b>	<b>Water absorption</b>	<b>GGBFS Replcement</b>	<b>Grade</b>	<b>Mix Type</b>
20 mm	2.78	1.96			
10 mm	2.76	1.84	<b>50%</b>	<b>M40</b>	<b>OPC + GGBS</b>
M. Sand	2.7	2.95			

<b>Cement Brand</b>	<b>OPC 53</b>	<b>GGBFS</b>	<b>20 mm</b>	<b>10 mm</b>	<b>M. Sand</b>	<b>Free water</b>	<b>Free w/b</b>
Ultratech, Chandrapur	225	225	527	531	820	150	0.33

<b>Admixture Dosage</b>	<b>Controlled Mix</b>	<b>With 800ECO</b>	<b>With 800ECO</b>	<b>OPC 53</b>	<b>GGBS</b>	<b>Aggregate</b>
<b>SikaViscocrete 495 PR</b>	<b>0.95%</b>	<b>0.95%</b>	<b>0.95%</b>	<b>Ultratech Chandrapur</b>	<b>JSW</b>	<b>Kundewal- Uran</b>
<b>Sika Rapid 800ECO</b>	<b>0%</b>	<b>0.5%</b>	<b>1.0%</b>			

## SLUMP/FLOW RETENTION,

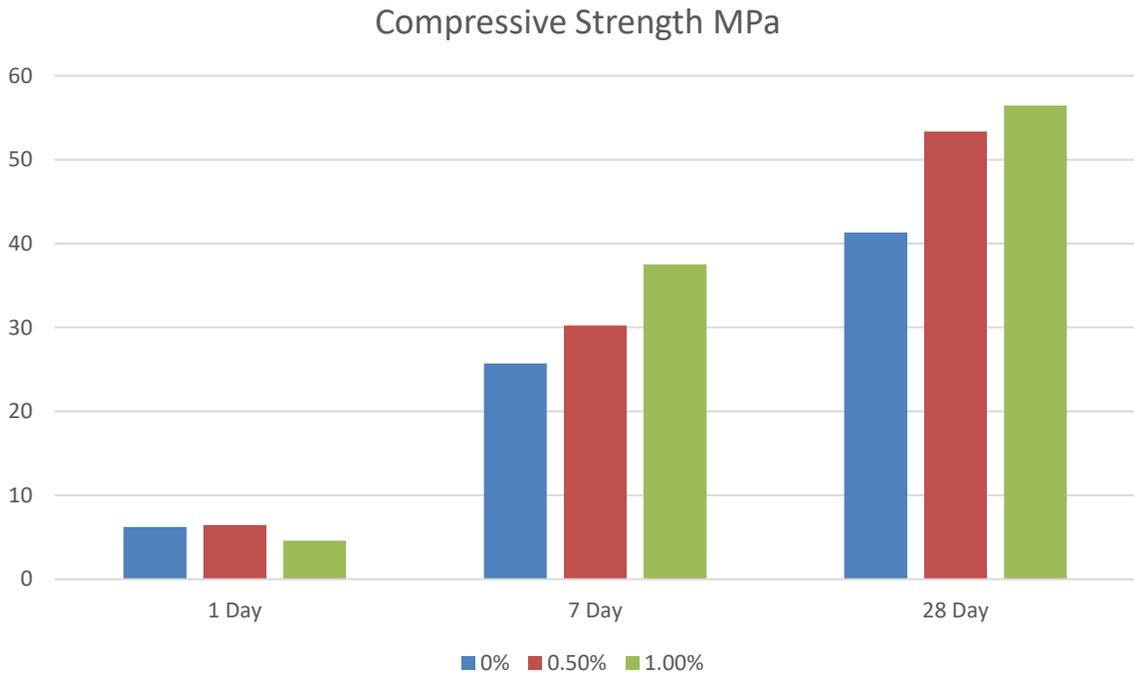
Slump Retention mm



	0.00%	0.50%	1.00%
<b>Dosage of 800ECO</b>	0.00%	0.50%	1.00%
Initial	240	240	240
60 Minutes	230	230	230
120 Minutes	200	210	200
180 Minutes	170	200	180

# Performance benchmarking of Sika Rapid 800ECO

- Compressive strength MPa



Dosage of 800ECO	1 Day	7 Day	28 Day
0%	6.23	25.71	41.32
0.50%	6.45	30.23	53.36
1.00%	4.6	37.5	56.45

In all the trials we reduced water from Batch what is going extra with Rapid 800ECO dosage

# Kalpataru Crescendo : Pune

- Developer : Kalpataru
- Project : Kalpataru Crescendo
- Contractor : Tricon Infrabuildtech Pvt
- Concrete Quantity: 35,000 Cu.m ( 17.5 INR Mio)
  
- Challenges:
- High-rise pumping.
- Economical mix as compared to SCC.
- Form finish concrete.
- Cycle time of modular formwork
  
- Sika Solution: Low Carbon SCC
- Pump pressure reduction from 200 bars to 150 bars.
- 3 slab cycles in 1 month as compared to 2 in flow concrete
- 6 floors completed in 2 months
- Enhance surface finish quality.



# Pashmina Waterfront: Shapoorji Pallonji Company Limited



- Developer : Pashmina Developer – Bangalore
- Project : Pashmina Waterfront
- Contractor : SPCL
- Concrete Quantity: 60,000 Cu.m

## Challenges:

- High-rise pumping with stable mix
- Form finish concrete.
- Cycle time of modular formwork

## Sika Solution: Low Carbon Concrete

- Reduce in cement from existing mix design by 20 kg
- Reduction in concrete pouring time by 25%
- Enhance surface finish quality.

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# SUMMERY

## 3E Concept

Sika Low Carbon Concrete embodies the '3E' concept: Economic, Environmental, and Ergonomic, promoting sustainability.

## Sustainable Future

Choosing Sika Low Carbon Concrete is an investment in a sustainable future, reducing environmental impact.

## Cost Savings and Safety

Clients benefit from cost savings and enhanced safety features when using Sika Low Carbon Concrete.





**Thank You**