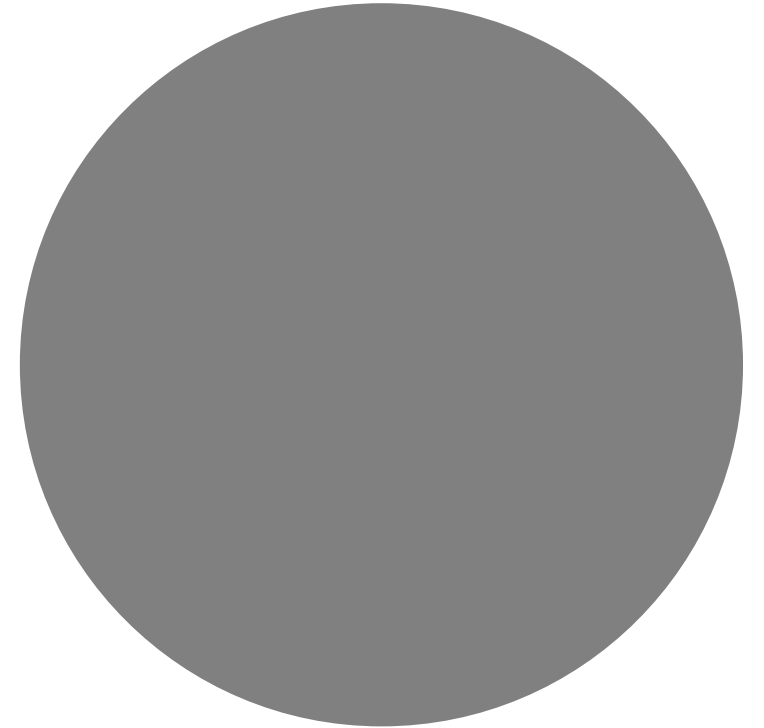


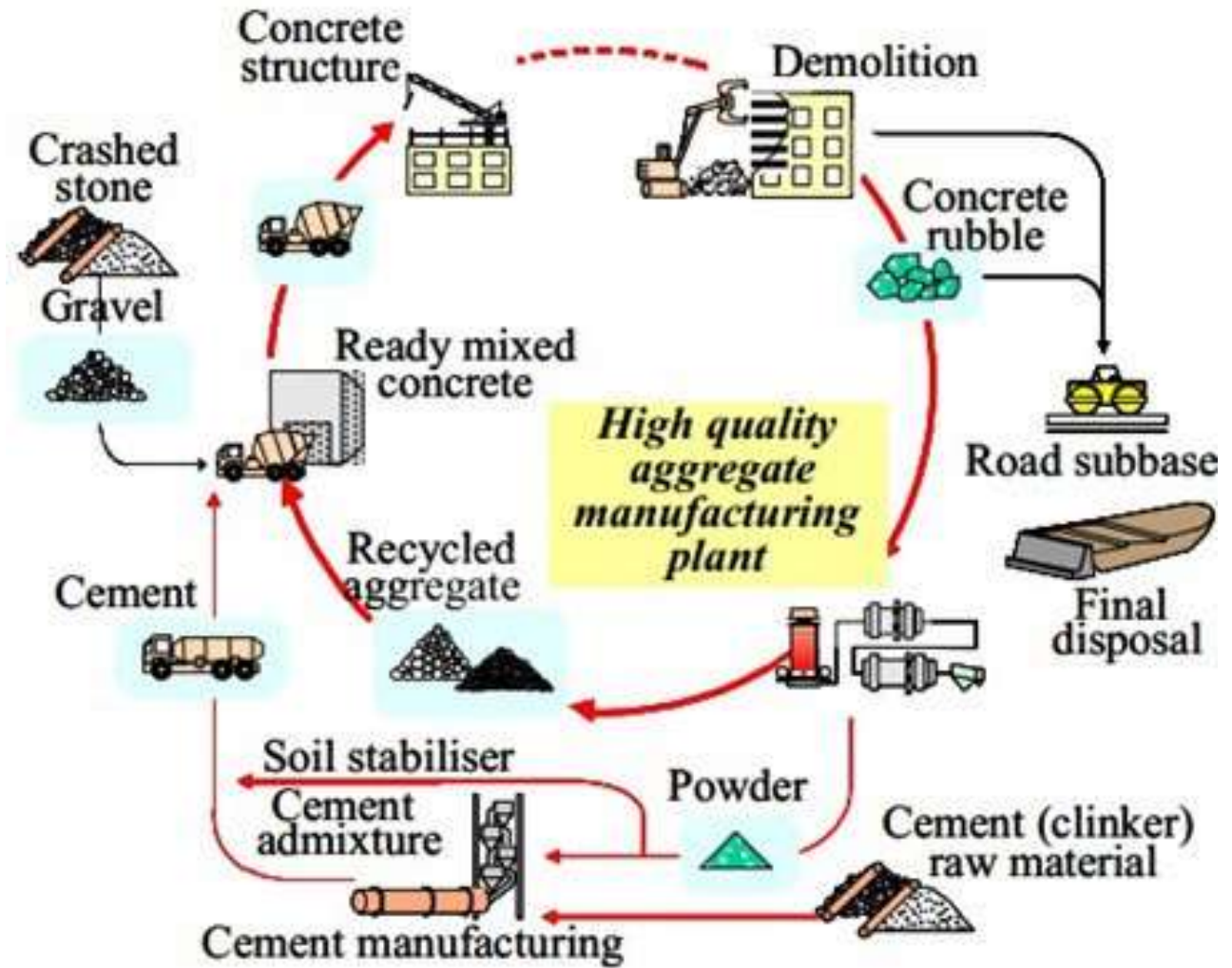
The Effect of Recycled Coarse Aggregate (RCA) with Surface Treatment on Concrete Mechanical Properties

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Source :
<http://theconstructor.org/concrete>

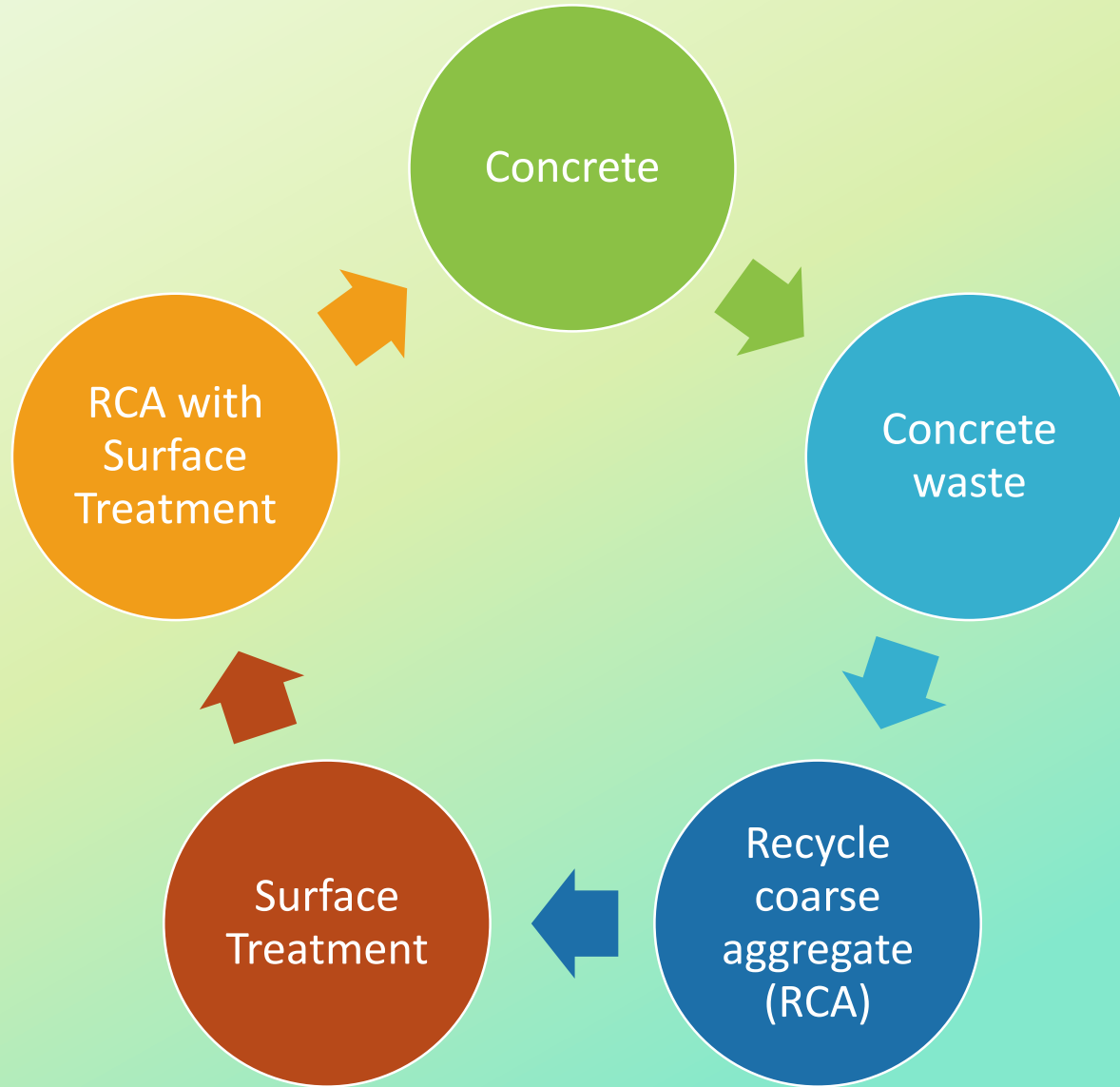


Introduction

Discusses the recycling system for concrete due to environmental and resource preservation issues.

The construction and demolition wastes are defined as the solid waste generated from the construction

These wastes can be utilized as the recycled coarse aggregate (RCA)



Experimental work

Material a fine aggregate from Progo River, a specific gravity 2.63 with fine modulus 3.54

Natural coarse aggregate from Clereng (Kulon Progo), a specific gravity 2.57 with fine modulus 6.49

RCA in the form of concrete waste was generated by the building Structure and Material Laboratory of Atma Jaya Yogyakarta University, RCA without Surface treatment had specific gravity 2.34 with water absorption 7.96%

recycled
aggregate
concrete

characteristics of the RCA
has the higher water
absorption value than
normal aggregate.

The recycled aggregate
has lower specific gravity
than normal aggregate

Experimental work

RCA with surface treatment are classified as low quality

Surface treatment conducted using acrylic material with trade Sikagard (polymer used for coating exposed concrete)

The surface treatment resulted a specific gravity 2.31 and water absorption value 2.97%

This study used RCA proportion of 50% and 100%



Surface Treatment

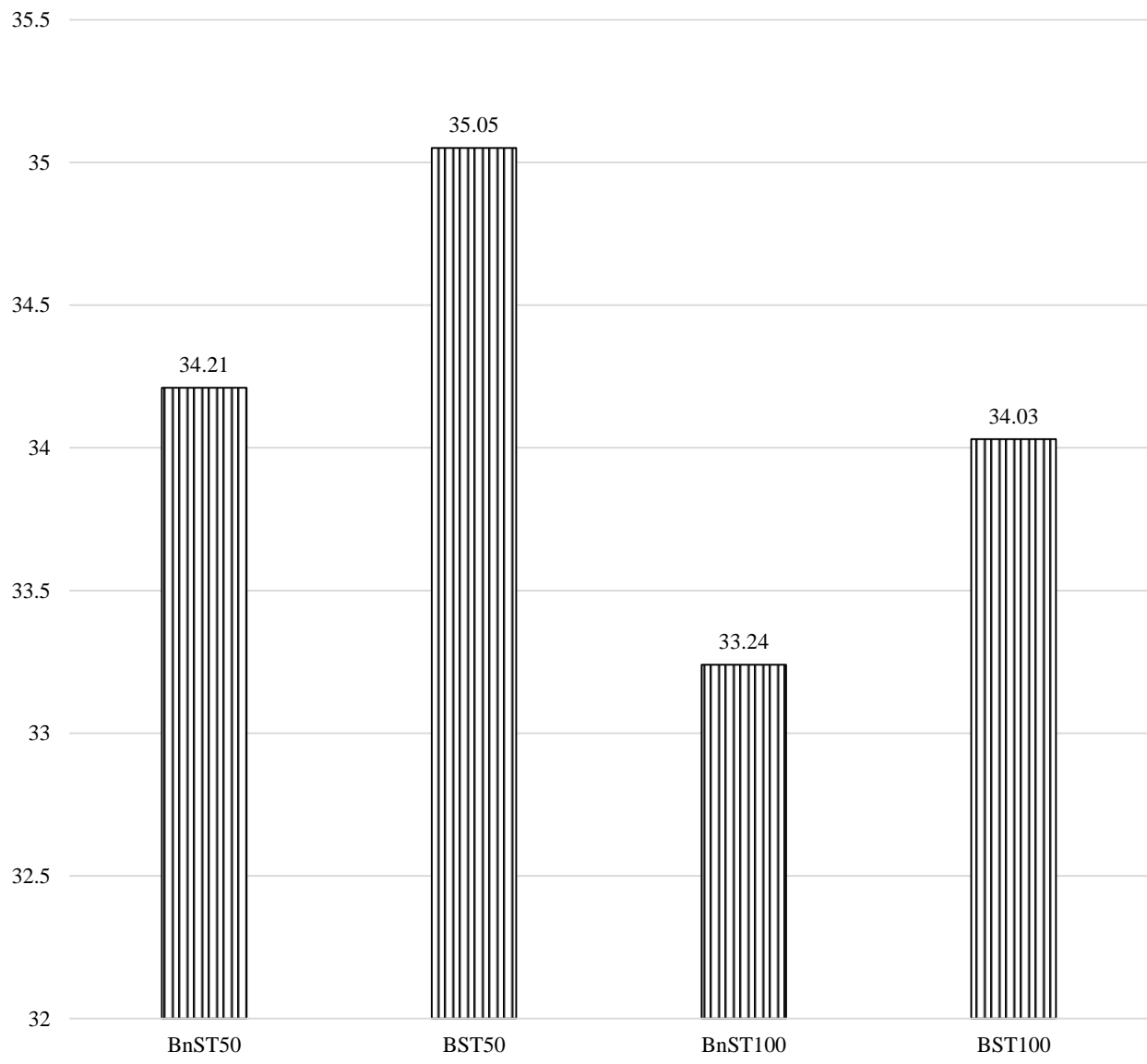
Table 1. Concrete mixture compositions

Specimens	BST50	BST100	BnST50	BnST100
PPC (kg)	465.68	465.68	465.68	465.68
Fine Aggregate (kg)	644.28	644.28	649.61	649.61
Natural Coarse Aggregate (kg)	493.66	0	493.66	0
ST Recycled Aggregate (kg)	444.29	927.14	0	0
Non-ST Recycled Aggregate (kg)	0	0	450.41	934.81
Water (liter)	204.9	204.9	204.9	204.9

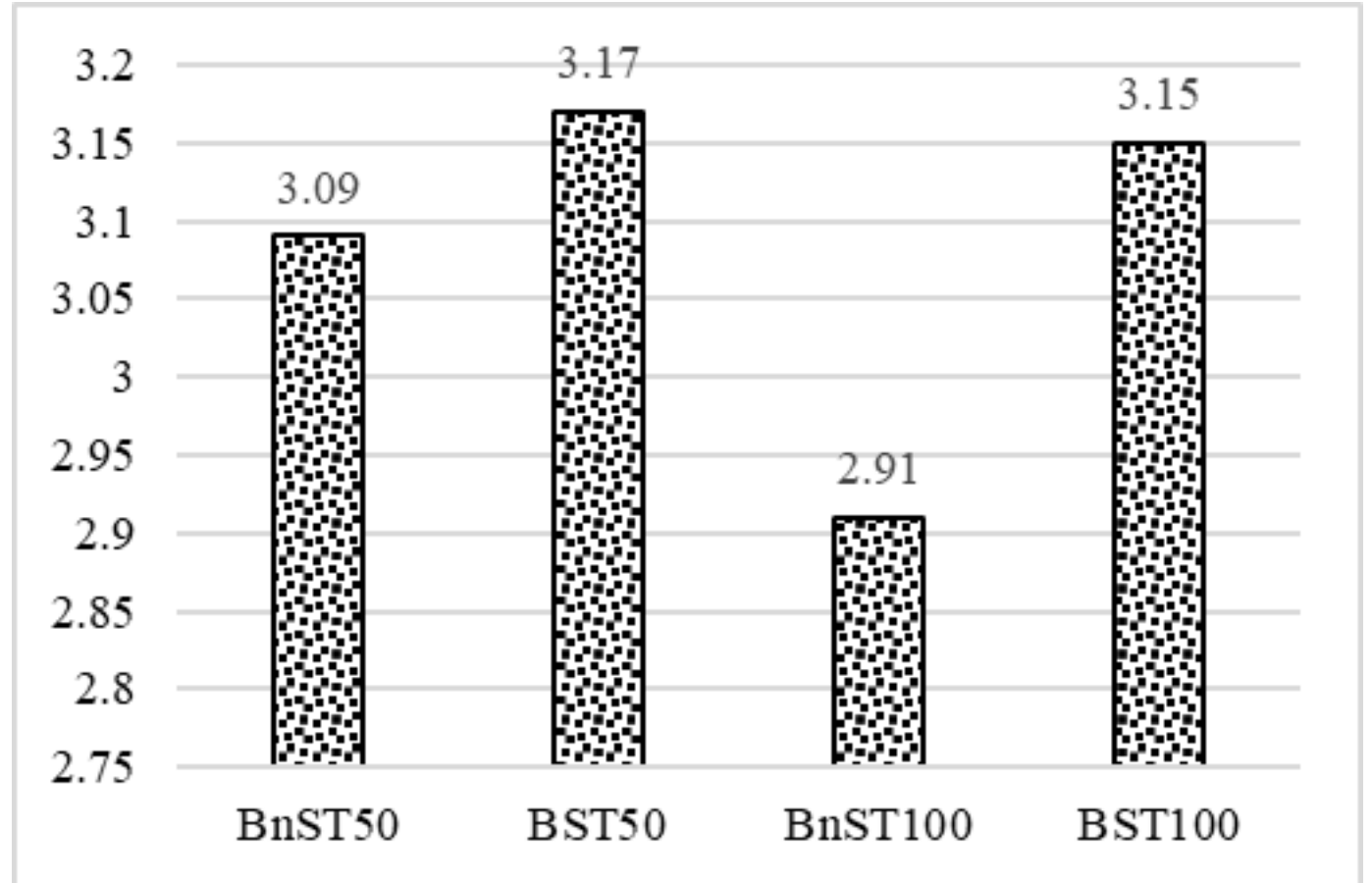
Table 3.Concrete density

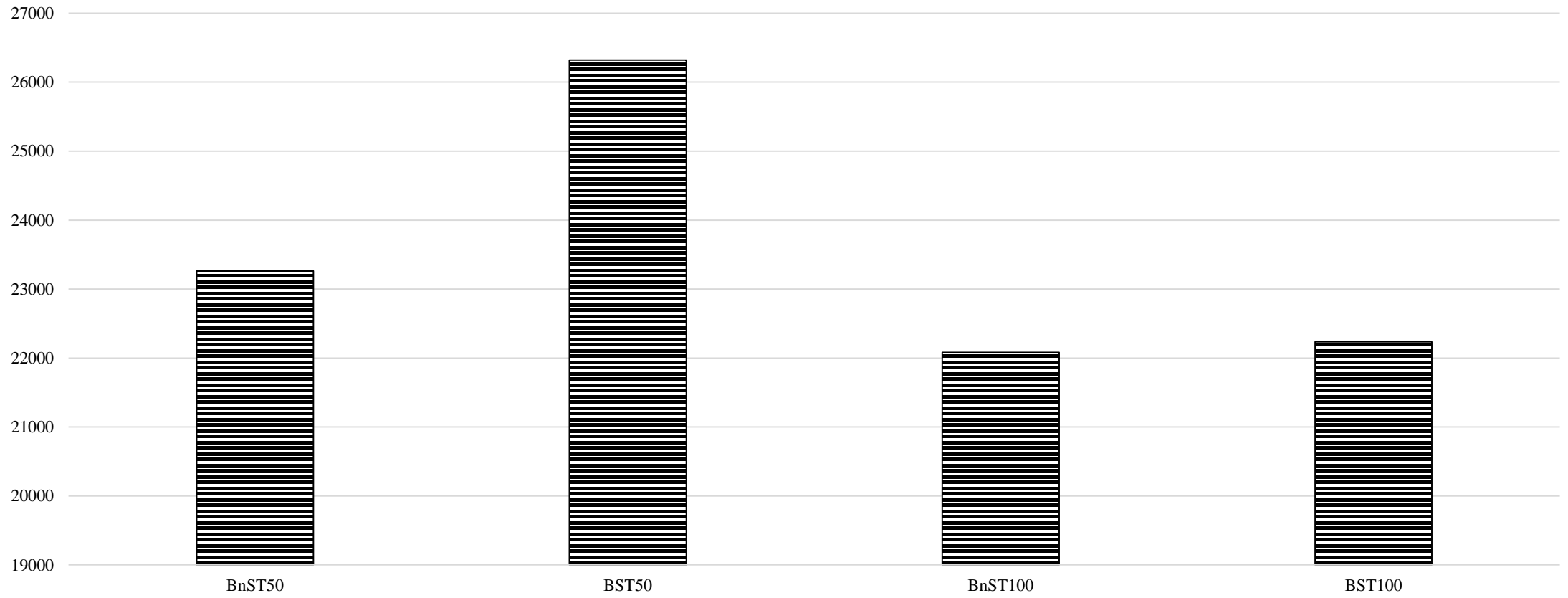
Specimens	Density (kg/m ³)	Category
BnST50	2404.06	normal concrete
BST50	2423.61	normal concrete
BnST100	2393.29	normal concrete

Compressive strength



Split Tensile test





Modulus elasticity

conclusion

- The recycled aggregate concrete used in this study was categorized as normal concrete as the average density was 2200-2500 kg/m³
- The surface treatment on the RCA may reduce the water absorption from 7.96% to 2.96%

Conclusion

The surface treatment for substitution 50% and 100%

- Compressive strength increase of 2.46% and 2.38%
- Split tensile strength increased of 2.59% and 8.25%
- Modulus of elasticity increased of 13.14% and 0.69%

