

**SELF COMPACTING CONCRETE USING RED TILE WASTE
AS FINE AGGREGATE**

Final Project Report

as one of requirement to obtain S1 degree from

Universitas Atma Jaya Yogyakarta

By:

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**INTERNATIONAL S1 PROGRAM
DEPARTMENT OF CIVIL ENGINEERING
FACULTY OF ENGINEERING
UNIVERSITAS ATMA JAYA YOGYAKARTA
YOGYAKARTA
2017**

STATEMENT

I signed below stating that the final project with the title:

**“SELF COMPACTING CONCRETE USING RED TILE WASTE
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It is the result of my own work and not a result of plagiarism of other people's work. Ideas, research data, and quotes directly or non-directly derived from the writings or ideas of others expressly provided in this Final Project. If it is proven later that this Final Project is the result of plagiarism, the graduation certificate that I received will be canceled and returned to Universitas Atma Jaya Yogyakarta.

Yogyakarta, 31 May 2017

Who made the remarks,



Crezensia Alfiora Deadema Dias Octobenita

APPROVAL

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AS FINE AGGREGATE**

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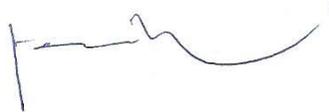
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Has been approved

Yogyakarta, ... *June 02, 2017* ...

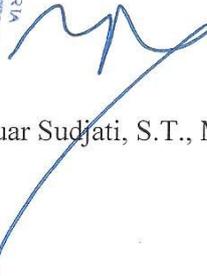
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Head of Civil Engineering Department,



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APPROVAL EXAMINER

Final Project

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By:

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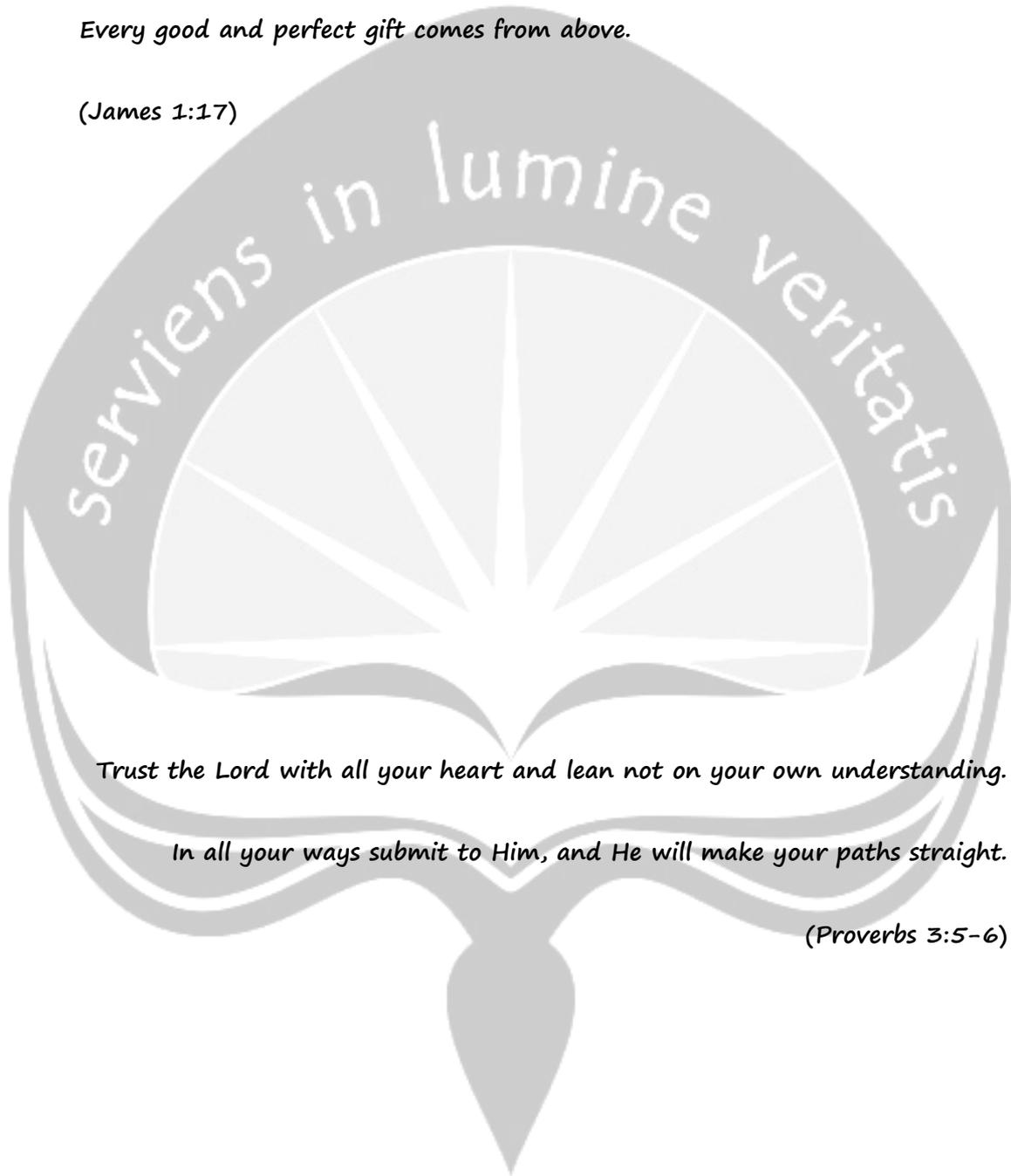
Has been examined and approved by the examination committee

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Member	: Prof. Ir. Yoyong Arfiadi, M.Eng., Ph.D		June 5, 2017
Member	: Dinar Gumilang Jati, S.T., M.Eng		31/5 2017

MOTTO

Every good and perfect gift comes from above.

(James 1:17)



Trust the Lord with all your heart and lean not on your own understanding.

In all your ways submit to Him, and He will make your paths straight.

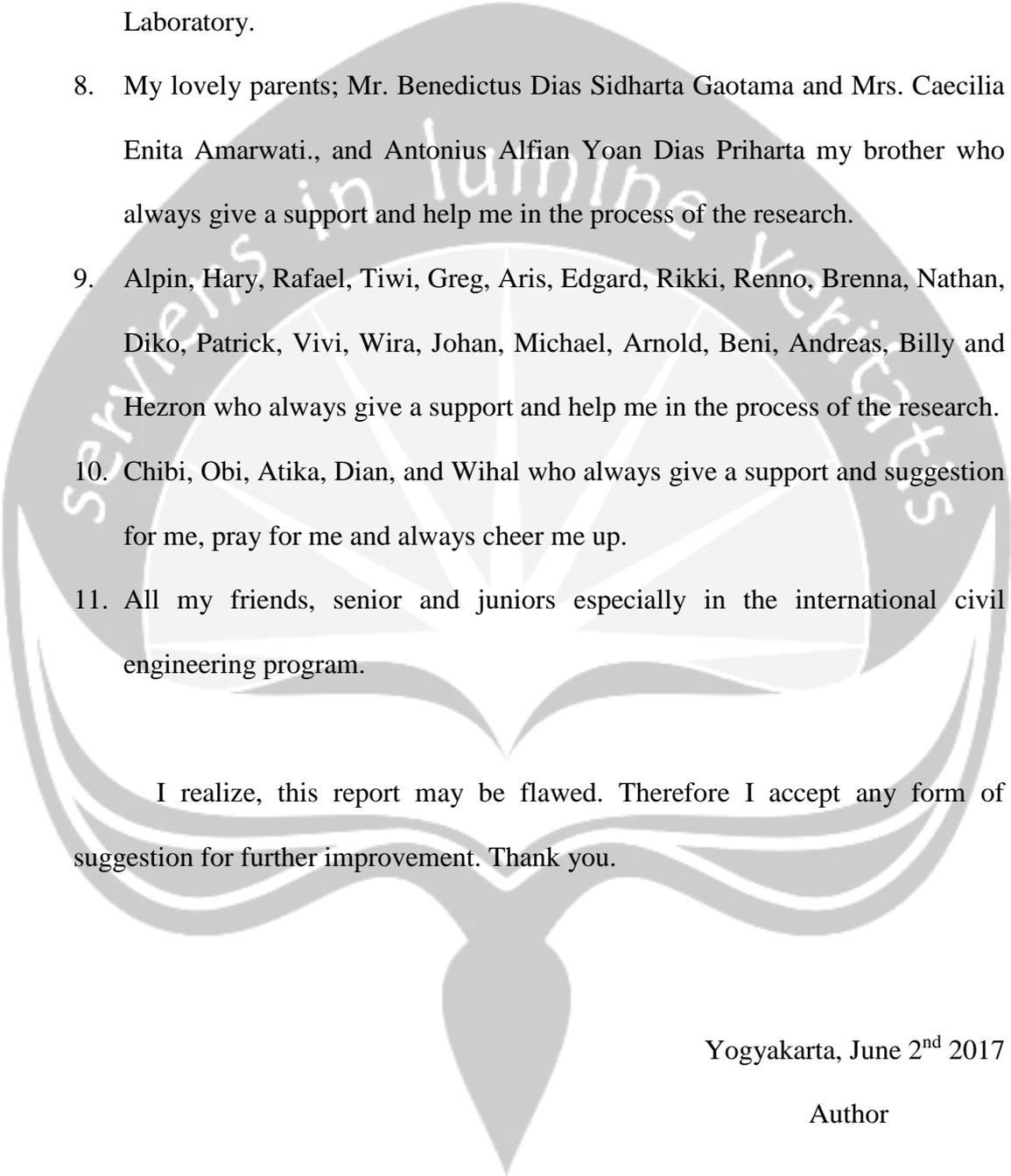
(Proverbs 3:5-6)

I dedicated this Final Project to my Lord and my Family

ACKNOWLEDGEMENTS

Thank you to my Lord Jesus, because of His blessings, this final project can be finished on time and without any serious problem. The purpose of the final project with the title “Self Compacting Concrete using Red Tile Waste as Fine Aggregate“ is to complete the requirement of undergraduate program (S-1) in Faculty of International Civil Engineering Program, Universitas Atma Jaya Yogyakarta. For the completion of this final project, I also would like to express my gratitude towards:

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- 
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 10. Chibi, Obi, Atika, Dian, and Wihal who always give a support and suggestion for me, pray for me and always cheer me up.
 11. All my friends, senior and juniors especially in the international civil engineering program.

I realize, this report may be flawed. Therefore I accept any form of suggestion for further improvement. Thank you.

Yogyakarta, June 2nd 2017

Author

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ABSTRACT

SELF COMPACTING CONCRETE USING RED TILE WASTE AS FINE AGGREGATE, Crezensia Alfiora Deadema Dias Octobenita, Student ID 131314883, year 2017, structure specialization, International Civil Engineering Program, Faculty of Engineering, Universitas Atma Jaya Yogyakarta.

Self-Compacting Concrete is mixed concrete that able to compact by itself without using a vibrator. Instead, use superplasticizer to help concrete in the self-compacting process and can reduce the amount of water and increase the workability of the concrete. This research used red tile waste as a substitute fine aggregate. The aim of this research is to determine the effect of red tile waste on self-compacting concrete.

The tests that conducted in this research were compressive strength, modulus of elasticity and modulus of rupture. Specimen for compressive strength test are 54 concrete cylinders, the test is done when the concrete has reached age of 7, 14 and 28 days. Specimen for modulus of elasticity test are 18 concrete cylinders, the test is done when the concrete has reached age of 28 days. While, specimen for modulus of rupture test are 18 concrete beams, the test is done when the concrete has reached age of 28 days. Mix design used SNI 03-2834-2000, compressive strength planning of 25 MPa, water cement ratio (wcr) 0.45, percentage of red tile waste substitution are 0%, 10%, 20%, 30%, 40% and 50%, superplasticizer viscocrete-10 used as much as 1.25% of weight of cement. Cylinder sample has diameter 150 mm and height 300 mm, beam sample has dimension (100x100x500) mm.

The results showed (1) the average density of self-compacting concrete was 2374.6665 kg/m³. (2) the highest value of compressive strength when the concrete at the age 7, 14 and 28 days occur in concrete with 50% red tile waste proportion were 64.74 MPa, 65.56 MPa and 71.94 MPa, respectively. (3) the highest value of modulus of elasticity when the concrete at the age 28 days occur in concrete with 50% red tile waste proportion was 26856.52 MPa. (4) the highest value of modulus of rupture when the concrete at the age 28 days occur in concrete with 50% red tile waste proportion was 7.07 MPa.

Keyword: Self-Compacting Concrete, red tile waste, viscocrete-10, compressive strength, modulus of elasticity, modulus of rupture.

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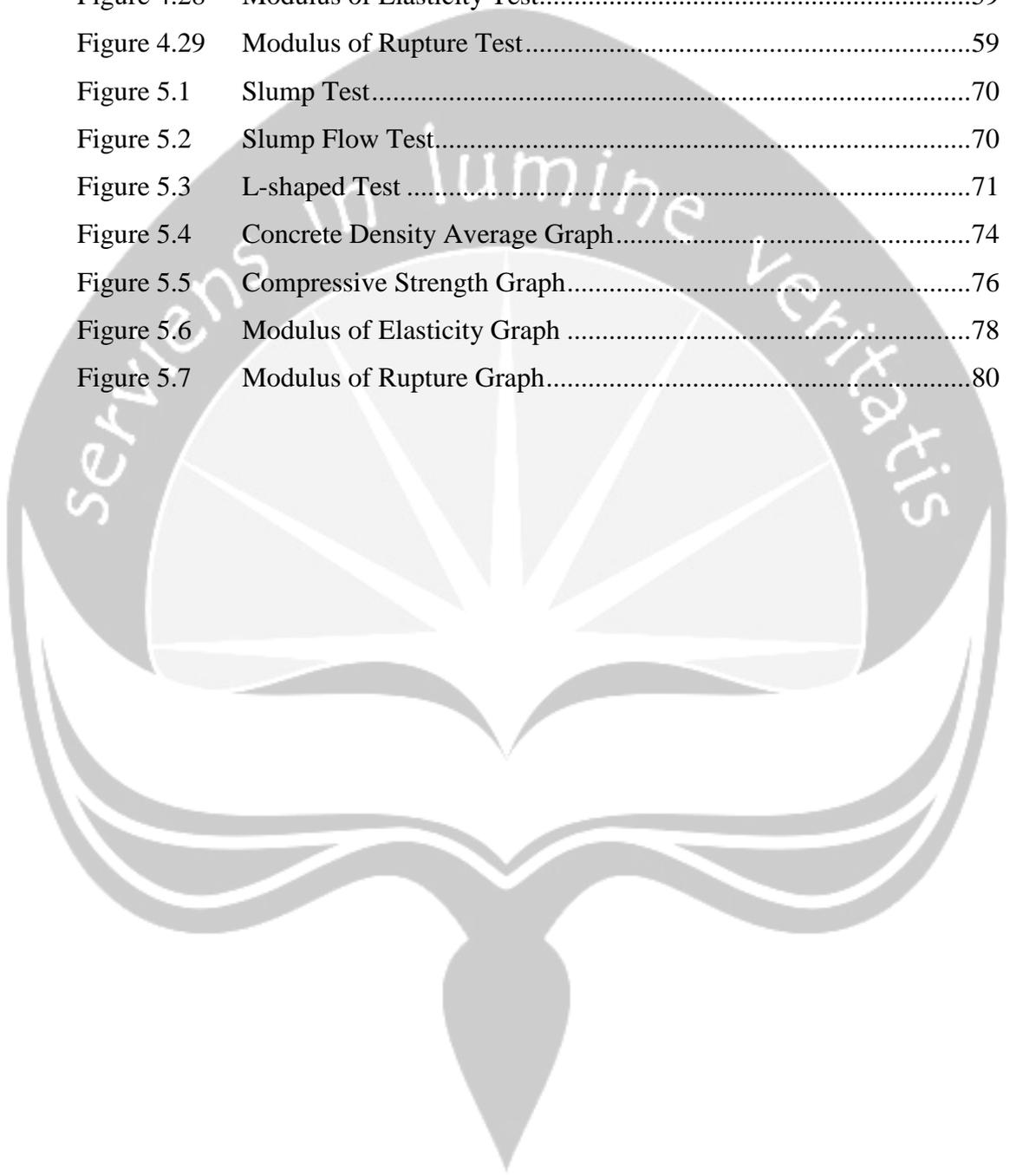
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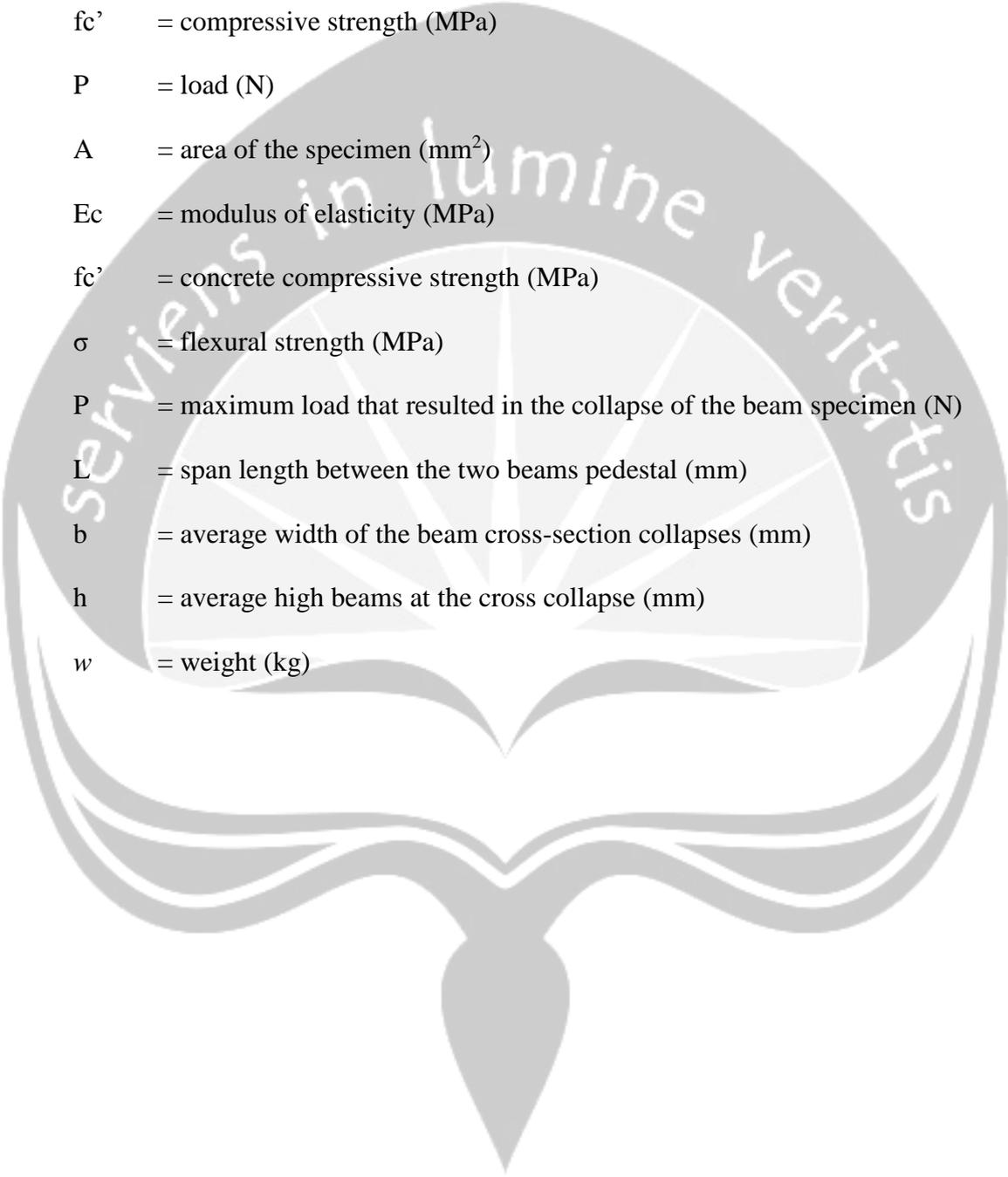
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LIST OF NOTATIONS



f_c'	= compressive strength (MPa)
P	= load (N)
A	= area of the specimen (mm^2)
E_c	= modulus of elasticity (MPa)
f_c'	= concrete compressive strength (MPa)
σ	= flexural strength (MPa)
P	= maximum load that resulted in the collapse of the beam specimen (N)
L	= span length between the two beams pedestal (mm)
b	= average width of the beam cross-section collapses (mm)
h	= average high beams at the cross collapse (mm)
w	= weight (kg)

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