

**FINAL PROJECT**

**DESIGN OF AIRPORT FLEXIBLE PAVEMENT USING FAA  
AND FAARFIELD SOFTWARE**



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**CIVIL ENGINEERING STUDY PROGRAM  
FACULTY OF ENGINEERING  
UNIVERSITY OF MUHAMMADIYAH YOGYAKARTA**

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**FINAL PROJECT**

**DESIGN OF AIRPORT FLEXIBLE PAVEMENT USING FAA AND  
FAARFIELD SOFTWARE**

Submitted to complete the requirements for a Bachelor of Engineering degree in  
the Civil Engineering Study Program, Faculty of Engineering,  
University Muhammadiyah Yogyakarta



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## STATEMENT LETTER

*Assalamu'alaikum Wr Wb*

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Hereby declare that this final assignment is part of the supervisor's paying research with the research title:

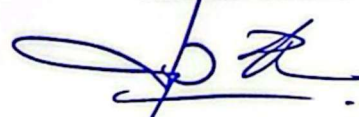
DESIGN OF AIRPORT FLEXIBLE PAVEMENT USING FAA AND FAARFIELD SOFTWARE

Thus, this statement is made with all seriousness.

*Wassalamu'alaikum Wr Wb*

Yogyakarta, 23 July 2024

Research Lecturer



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## **DEDICATION PAGE**

*Alhamdulillah Rabbil'Alamin*, Thanks for the presence of Allah SWT, Almighty God, and His mercy and grace. I can become a knowledgeable person who can complete this final assignment. Shalawat and greetings are always poured out on the Prophet Muhammad SAW. Thanks to the prayers of family and friends, this final assignment was completed well. For this reason, I dedicate this final assignment to:

1. Allah SWT provided convenience and smoothness in preparing this Final Assignment.
2. Bapak Prof. Ir. Sri Atmaja P. Rosyidi, Ph.D., Who has guided me in the preparation of the Final Assignment.
3. Bapak Ir. Dian Setiawan M., S.T., M.Sc., Ph.D., A.M.ASCE as Final Assignment Examining Lecturer.
4. My parents, Father Farah Abdalrahman and Mother Batul Al-jazoli, continue to provide me with support in the form of moral and material. Father and Mother need to know that I love and cherish you both with all my body and soul. Thank you for your struggle; allow me to serve and repay all the sacrifices you have made so far.
5. Friends who have helped in this research.
6. All parties are involved in preparing the thesis.
7. Thank you for being able to survive during the lecture period.

## FOREWORD



*Assalamu 'alaikum warahmatullahi wabarakatuh*

Praise Allah SWT, who controls all things. Sholawat and greetings are continuously poured out to Rasulullah SAW and his family and friends.

This final assignment was prepared as one of the requirements for obtaining a Bachelor of Engineering degree in the Civil Engineering Study Program, Faculty of Engineering, Muhammadiyah University of Yogyakarta. This research aims to design airport flexible pavement using FAA and FAARFIELD software.

During the preparation of this final assignment, the author encountered many obstacles, but thanks to the help, guidance, and encouragement from various parties, it was finally resolved successfully. Through this opportunity, the author would like to express his gratitude for the cooperation and support from various parties during the research process until the preparation of this final assignment to:

1. Ir. Puji Harsanto, S.T., M.T., Ph.D as Head of the Civil Engineering Study Program at Muhammadiyah University of Yogyakarta.
2. Prof. Sri Atmaja P. Rosyidi as Final Project Supervisor.
3. Ir. Dian Setiawan M., S.T., M.Sc., Ph.D., A.M.ASCE as Final Assignment Examining Lecturer.

Finally, after all the abilities were poured out and accompanied by prayers to complete this final assignment, everything was returned to Allah SWT.

*Wassalamu 'alaikum warahmatullahi wabarakatuh.*

Yogyakarta,

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## LIST OF ABBREVIATIONS

AC	: Advisory Circular
CAN	: Aircraft Classification Number
ASTM	: American Society for Testing and Materials
CBR	: California Bearing Ratio
CDF	: Cumulative Damage Factor
FAA	: Federal Aviation Administration
FAARFIELD	: FAA Rigid and Flexible Iterative Elastic Layered Design
ICAO	: International Civil Aviation Organization
LED	: Layered Elastic Design
LED FAA	: FAA Layered Elastic Design
PCN	: Pavement Classification Number
HMA	: Hot Mix Asphalt
DF	: Design Factor
PCASE	: Pavement-Transportation Computer Assisted Structural Engineering
CC	: Construction Cycles
CAN	: Aircraft Classification Number
PG	: Performance Grade
FWD	: Falling Weight Deflectometer
WSSW	: wavelet-spectrogram analysis of surface wave
SASW	: Spectral Analysis of the Surface Wave
USW	: Ultrasonic Surface Wave
APSDS	: Aircraft Pavement Structural Design System
PI	: Pressure Index
PCI	: pavement Condition Index
PCC	: Portland Cement Concrete
EAD	: Equivalent Annual Departure
US	: United State
DL	: Design Life
NAS	: National Airspace System