Maintenance Management for Airport Airfield Using MicroPaver Computer Software

"Case Study"

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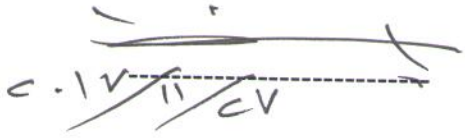
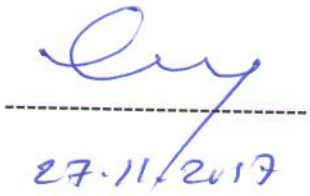
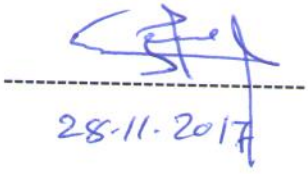
Prof. Dr. Basim Jrew (Supervisor) Prof. of Civil Engineering (Isra University) Amman- Jordan	
Prof. Dr. Subhi Bazlamit (Member) Prof.of Civil Engineering (Al Zaytoonah University of Jordan) Amman- Jordan	
Dr. Majed Msallam (Memebr) Associated Prof. of Civil Engineering (Isra University) Amman- Jordan	

Dedication

To

My Father

For earning an honest living for us and supporting and encouraging me to believe in myself

My Mother

Who taught me to trust in Allah

To My Brothers

Who always beside me in whole my life

Acknowledgements

After an intensive period of seven months, today is the day: writing this note of thanks is the finishing touch on my dissertation. It has been a period of intense learning for me, not only in the scientific arena, but also on a personal level. Writing this dissertation has had a big impact on me. I would like to reflect on the people who have supported and helped me so much throughout this period.

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List of Abbreviations

AC	Asphalt Concrete
PCC	Portland Cement Concrete
USA-CERL	United States Army Construction Engineering Research Laboratory
USDT	United States Department of Transportation
FAA	Federal Aviation Administration
M&R	Maintenance and Rehabilitation
USACE	United State Army Corps of Engineer
PCI	Pavement Condition Index
APMS	Airport Pavement Management System
PMS	Pavement Management System
MMS	Maintenance Management System
PCASE	Pavement Computer Assisted Structural Engineering
PCN	Pavement Classification Number
ACN	Aircraft Classification Number
NASAO	National Association of State Aviation Officials
SWY	Stop Way of the Runway
PMS	Pavement Management System
ICAO	International Civil Aviation Organization
ASTM	American Society for Testing and Materials
AASHTO	American Association of State Highway and Transportation Officials
HMA	Hot Mix Asphalt
HWD	Heavy Weight Deflectometer
FOD	Foreign Object Debris
BBI	Boeing Bump index
CFME	Continuous Friction Measurement Equipment
mm	millimeter

LTD cracks	Longitudinal, Transverse and Diagonal Cracks
ASR	Alkali-Silica Reaction
PSI	Present Serviceability Index
PSR	Present Serviceability Rating
DV	Deduct Value
TDV	Total Deduct Value
ROI	Rate Of Interest
GIS	Graphical Information System
LCD	Last Construction Date
NATO	North Atlantic Treaty Organization
CTB	Cement Treated Base
SAMI	Stress Absorption Membrane Interlayer
RWY	Runway
TWY	Taxiway
APC	Asphalt over Portland Cement Concrete
JOD	Jordanian Dinar

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Abstract

Maintenance Management for Airport Airfield Using MicroPaver Computer Software "Case Study"

Sahel Mohammad Eneizat

Maintenance management system and Airport Pavement Management System (APMS) developed and found by airport agencies and operator to keep the facilities in airfield running in full capacity. The expert system such as Pavement Management System (PMS) found and developed in the late of 1970s such as Micro Paver to help airport management in their decision regarding maintenance activity in the airfield.

Research aims is to construct and establish Maintenance Management System (MMS) for airport with systematic procedure for maintaining and updating the pavement condition. Since the airfield pavement represent an important infrastructure in the airports. This infrastructure requires care through periodic evaluation and continuous maintenance to keep the airfield pavement operation under acceptable level of service.

In this study, historical data of airfield pavement distress were collected. These data categorized and analyzed using Micro Paver and Paveair softwares which are used to calculate current pavement condition and the future condition prediction.

The study was conducted on airfield pavement of international airport. The selected airfield contains: two parallel runways, fourteen taxiway, and seven aprons which are includes commercial apron, cargo apron and maintenance apron. Visual condition survey were conducted and the analysis performed to determine the effective maintenance selection, budget determination, and budget prioritizing for current and future condition.

The proposed APMS include four major components: Data collection, Data Analysis, Maintenance and Rehabilitation plan (M&R) and implementation.

Key Word: Airport Pavement Management System (APMS), Maintenance Management System (MMS), Maintenance and Rehabilitation (M&R), Micro paver Software, and Paveair software