DEVELOPMENT OF FAST AND BOUNCY CRICKET PITCHES IN SRI LANKA

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Degree of Master of Science

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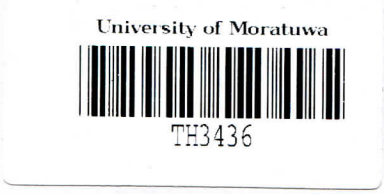

June, 2017

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The research thesis was submitted in partial fulfillment of the requirements for the Degree of Master of Science

Supervised by Dr. U.P. Nawagamuwa

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June, 2017

DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Dr. U.P. Nawagamuwa

ABSTRACT

Development of Fast and Bouncy cricket pitches in Sri Lanka

Most cricket batsmen in Indian subcontinent face a great difficulty in batting against fast bowlers on English and Australian fast and bouncy cricket pitches. The lack of having such practice pitches in home is the main reason for their lack of performances in fast pitches. It had been discovered that the pace and bounce of a cricket pitch is governed by clay content, clay mineralogy, sand content, organic matter content and grass content of the top layer of a cricket pitch.

Six local soils and one soil from India were tested for their index properties as the preliminary step. The soils which were fulfilling the requirement of the soil properties of fast and bouncy cricket pitch material were selected along with the currently used soil for Sri Lankan cricket pitch preparation and used for the laboratory model studies.

Six cubic samples for the friction and bounce comparison were prepared inside the laboratory from selected three soils varying the surface grass content.

The co-efficient of friction (μ value) and the co-efficient of restitution (e value) were determined by the bounce test and friction test respectively. Soils which had low "μ" value and high "e" value were selected as suitable soils for the further proceedings of the research.

MU and TY along with MT (Mixture of both MU and TY) were selected to carry on further studies in an actual cricket pitches in order to check their ability to generate pace and bounce.

Besides selected area of the cricket pitch was daily photographed and surface crack density was analysed using MATLAB software.

MU was selected as the most suitable soil from among all tests soils and recommended to be used for the development of local fast and bouncy cricket pitches in Sri Lanka.

Keywords: Pace, bounce, cricket pitch, clay

DEDICATION

To my parents, teachers and all cricket loving readers

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LIST OF ABBREVIATIONS

Abbreviation	Description
MU	Murunkan soil
TY	Tyronne Fernando Stadium soil
KO	Kotawehera soil
MT	Murunkan: Tyronne = 1:1 mixed Soil
+GR	with Grass
D.A.C	Days after compaction
PL_{MU}	Ball pitching line for MU strip
PL_{MT}	Ball pitching line for MT strip
PL_{TY}	Ball pitching line for TY strip
H_p	Height of the ball measured by the pole
H_{TY}	Corrected vertical ball height for TY soil
H_{MU}	Corrected vertical ball height for MU soil
HB	Hockey Ball
TCB	Test Cricket Ball
PM	Pitch Model
ms	milliseconds
T_{In}	Time when ball passes the 1st pole
T_{Out}	Time when ball passes the 2nd pole

T_p	Ball pitching time
g	gravitational acceleration 9.81 ms^{-1}
J	Joules
k	kilo
LPA	Laser Particle Analyser
Gs	Specific gravity
μ	Coefficient of Friction
e	Coefficient of Restitution
m	meters
cm	centimeters
ER%	Percentage reduction in total energy
MC%	Moisture Content
USCS	Unified Soil Classification System
SL	Sri Lanka / Sri Lankan
AUS	Australia / Australian
L/H	Light hand operated roller
H/H	Heavy hand operated roller
VR	Vibratory Rammer
WBR	Walk behind roller