

**PREDICTING LOS ANGELES ABRASION OF ROCKS
IN SRI LANKA
FROM SOME PHYSICAL AND MECHANICAL
PROPERTIES OF ROCK**

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(09/8806)



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Degree of Master of Engineering

Department of Civil Engineering

University of Moratuwa

Sri Lanka

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Abstract

As urbanization and development rapidly increase, the demand for high quality aggregates becomes progressively higher. Thus quality controlling of rock aggregates is a major concern in construction industry.

The engineering properties of different rock types in Sri Lanka are not the same and therefore the suitability of rock aggregates should be investigated prior to use for construction works. The cost and time implication of the quality control process is becoming a concern from the entrepreneurial point of concern. Cost and time of quality controlling can be minimized via finding correlations between different tests on aggregates and rocks.

Laboratory studies were carried out to investigate the existence of relationship between LAAV and AIV, ACV, TFV, UCS, Point Load Index (PL), Specific Gravity (SG), Water Absorption (WA), Methylene Blue Absorption (MBA) and soundness parameters of the rocks in Sri Lanka. Fresh rock samples of different rock types were collected from quarries operating in various locations and exposed rocks in different localities within Sri Lanka to correlate each parameters.

Results from different rock types were analyzed separately using EXCEL by the means of least square regression methods. A linear relationship between LAAV and AIV was found with R^2 value of 0.7728 for Biotite Gneiss rock and exponential relationship between LAAV and AIV was found with R^2 value of 0.6609 for Charnokite/Charnokitic Gneiss rock. Relationships between LAAV and ACV for Biotite Gneiss and impure marble as well as relationships between LAAV and PL and LAAV and TFV for Biotite Gneiss were obtained with significant R^2 values. Strong relationship could not be obtained between LAAV and Soundness, MBA, SG and WA.

Key words:

Quality controlling, LAAV, Correlations, EXCEL, regression methods

TABLE OF CONTENTS

Contents	Page No
Acknowledgements-----	i
Abstract-----	ii
Table of Contents-----	iii
List of Tables-----	vii
List of Figures-----	viii
List of Abbreviations-----	ix
List of Appendices-----	x
Chapter 01: Introduction -----	1
1.1 Objectives-----	2
Chapter 02: Literature Review -----	3
2.1 Findings from previous research works-----	3
2.2 Physical and Mechanical Properties of Rocks-----	6
2.2.1 Los Angeles Abrasion Value (LAAB) Test-----	6
2.2.1.1 Introduction-----	6
2.2.1.2 Apparatus-----	7
2.2.1.3 Test Method-----	7
2.2.1.4 Method of Calculation-----	8
2.2.2 Aggregate Impact Value (AIV) Test-----	10
2.2.2.1 Introduction-----	10
2.2.2.2 Apparatus-----	10
2.2.2.3 Test Method-----	11
2.2.2.4 Method of Calculation-----	12
2.2.3 Ten Percent Fines Value (TFV) Test-----	12
2.2.3.1 Introduction-----	12
2.2.3.2 Apparatus-----	12
2.2.3.3 Test Method-----	13
2.2.3.4 Method of Calculation-----	14
2.2.4 Aggregate Crushing Value (ACV) Test-----	15

2.2.4.1	Introduction-----	15
2.2.4.2	Apparatus-----	15
2.2.4.3	Test Method-----	15
2.2.4.4	Method of Calculation-----	16
2.2.5	Specific Gravity and Water Absorption-----	16
2.2.5.1	Introduction-----	16
2.2.5.1.1	Bulk Specific Gravity-----	17
2.2.5.1.2	Bulk SSD Specific Gravity-----	17
2.2.5.1.3	Apparent Specific Gravity-----	17
2.2.5.1.4	Water Absorption-----	18
2.2.5.2	Apparatus-----	18
2.2.5.3	Test Method-----	18
2.2.5.4	Method of Calculation-----	19
2.2.6	Soundness-----	20
2.2.6.1	Introduction-----	20
2.2.6.2	Apparatus-----	20
2.2.6.3	Test Method-----	20
2.2.6.4	Method of Calculation-----	21
2.2.7	Point Load Strength Index-----	21
2.2.7.1	Introduction-----	21
2.2.7.2	Apparatus-----	22
2.2.7.3	Test Method-----	22
2.2.7.4	Method of Calculation-----	22
2.2.8	Uniaxial Compressive Strength-----	23
2.2.8.1	Introduction-----	23
2.2.8.2	Apparatus-----	23
2.2.8.3	Test Method-----	23
2.2.8.4	Method of Calculation-----	23
2.2.9	Methylene Blue Absorption (MBA) Test-----	24
2.2.9.1	Introduction-----	24
2.2.9.2	Apparatus and Reagents-----	24
2.2.9.3	Test Method-----	25
2.2.9.3.1	Preparation of the Methylene Blue solution	25
2.2.9.3.2	Preparation of the aggregate suspension----	25

2.2.9.3.3 Testing-----	26
2.2.9.4 Method of Calculation-----	27
Chapter 03: Methodology-----	29
3.1 Methodology for LAAV Test-----	29
3.2 Methodology for AIV Test-----	30
3.3 Methodology for ACV Test-----	30
3.4 Methodology for TFV Test-----	30
3.5 Methodology for Point Load Strength Index Test-----	31
3.6 Methodology for Specific Gravity & Water Absorption Test-----	31
3.7 Methodology for soundness Test-----	32
3.8 Methodology for Methylene Blue absorption Test-----	32
Chapter 04: Data Analysis-----	33
4.1 Correlation between LAAV (500 revolutions) and AIV-----	33
4.2 Correlation between LAAV (500 revolutions) and ACV-----	36
4.3 Correlation between LAAV (1000 revolutions) and Point Load Strength Index	38
4.4 Correlation between LAAV (1000 revolutions) and Soundness-----	39
4.5 Correlation between LAAV (1000 revolutions) and Methylene Blue Absorption	40
4.6 Correlation between LAAV (500 revolutions) and TFV-----	40
4.7 Correlation between LAAV (500 revolutions) and Water Absorption-----	42
4.8 Correlation between LAAV (500 revolutions) and Apparent Specific Gravity---	43
4.9 Correlation between LAAV (500 revolutions) and SSD Specific Gravity--	44
4.10 Correlation between LAAV (500 revolutions) and Dry Specific Gravity--	45
4.11 Validation of Derived Equations-----	46
4.12. Comparison of Derived Correlations with Results in Literature-----	48
Chapter 05: Discussion and Conclusion-----	50
5.1 Discussion-----	50

5.2 Conclusion-----	52
References-----	53
Appendix I: Data gathered to develop Correlations	
Appendix II: Sampling Locations	



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LIST OF TABLES

Contents	Page No
Table 2.1: Empirical equations to predict LAA value (Ozcelik, (2011))-----	4
Table 2.2: Empirical equations to predict rock properties (Koukis et al. (2006))	6
Table 2.3: Different Aggregate sizes used for LAAV (500 Revolutions) under ASTM C 131-89-----	8
Table 2.4: Different Aggregate sizes used for LAAV (1000 Revolutions) under ASTM C 535-89-----	9
Table 4.1: Prediction of LAAV from AIV for different rock types-----	34
Table 4.2: Prediction of LAAV from ACV for different rock types-----	36
Table 4.3: Prediction of LAAV (1000 revolution) from Point Load Index For Biotite Gneiss rock-----	38
Table 4.4: Prediction of LAAV (1000 revolution) from Soundness for Biotite Gneiss rock-----	39
Table 4.5: Prediction of LAAV (1000 revolution) from Methylene Blue Absorption for Biotite Gneiss rock-----	40
Table 4.6: Prediction of LAAV (500 revolution) from Ten Percent Fines Value (TFV) for Biotite Gneiss rock-----	41
Table 4.7: Prediction of LAAV (500 revolution) from Water Absorption for Biotite Gneiss rock-----	42
Table 4.8: Prediction of LAAV (500 revolution) from SG_{App} .for Biotite Gneiss rock-----	43
Table 4.9: Prediction of LAAV (500 revolution) from SG_{ssd} .for Biotite Gneiss rock-----	44
Table 4.10: Prediction of LAAV (500 revolution) from SG_{dry} .for Biotite Gneiss rock-----	45
Table 4.11: Comparison of LAAV, AIV correlations with Literature Results--	48

LIST OF FIGURES

Contents	Page No
Figure 2.1: Apparatus for the aggregate impact test (Millard, 1993)-----	11
Figure 2.2: Apparatus for the 10% fines test and aggregate crushing test (Millard, 1993)-----	13
Figure 4.1: The correlation between LAAV (500 revolutions) and AIV for Biotite Gneiss Rock-----	35
Figure 4.2: The correlation between LAAV (500 revolutions) and AIV for Charnokite Rock-----	35
Figure 4.3: Rock The correlation between LAAV (500 revolutions) and ACV for Biotite Gneiss Rock-----	37
Figure 4.4: The correlation between LAAV (500 revolutions) and ACV for Impure Marble Rock-----	38
Figure 4.5: The correlation between LAAV (1000 revolution) and Point Load Index values for Biotite Gneiss Rock-----	39
Figure 4.6: The correlation between LAAV (500 revolutions) and TFV for Biotite Gneiss Rock-----	42
Figure 4.7: The correlation between LAAV (500 revolutions) and WA values for Biotite Gneiss Rock-----	43
Figure 4.8: The correlation between LAAV (500 revolutions) and Apparent Specific Gravity values for Biotite Gneiss Rock-----	44
Figure 4.9: The correlation between LAAV (500 revolutions) and SSD Specific Gravity values for Biotite Gneiss Rock-----	45
Figure 4.10: The correlation between LAAV (500 revolutions) and Dry Specific Gravity values for Biotite Gneiss Rock-----	46
Figure 4.11: Predicted versus measured LAAV for Equation (1)-----	47
Figure 4.12: Measured versus predicted LAAV for Equation (2)-----	47

LIST OF ABBREVIATIONS

Abbreviation		Description
ACV	-	Aggregate Crushing Value
AIV	-	Aggregate Impact Value
ASTM	-	American Society for Testing and Materials
BS	-	British Standards
CI	-	Crushability Index
LA	-	Los Angeles
LAAV	-	Los Angeles Abrasion Value
MBA	-	Methylene Blue Absorption
PL	-	Point Load Strength Index
R^2		Correlation Coefficient
SG_{App}		Apparent Specific Gravity
SG_{Dry}	-	Bulk Dry Specific Gravity
SG_{SSD}	-	Bulk Saturated and Surface Dried Specific Gravity
SSD	-	Saturated Surface Dry
TFV	-	Ten Percent Fines Value
UCS	-	Uniaxial Compressive Strength
VFA	-	Voids Filled by Aggregate
VMA	-	Voids in Mineral Aggregate
WA	-	Water Absorption



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LIST OF APPENDICES

Appendix	Description
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