LB/DON/28/07

EXPERIMENTAL INVESTIGATION ON TEMPERATURE RISE DUE TO HEAT OF HYDRATION

THIS THESIS IS SUBMITTED TO THE DEPARTMENT OF CIVIL ENGINEERING IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ENGINEERING IN STRUCTURAL ENGINEERING DESIGN

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DECLARATION

I declare that this thesis is my own, unaided work, except where otherwise acknowledge. This is being forwarded for the degree of Master OF Engineering in the University of Moratuwa, Sri Lanka. It has not been submitted before for any degree or examination in any other University.

.....

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ABSTRACT

Early thermal cracking in concrete water retaining structures mainly depends on temperature fall between hydration peak and ambient temperature (T_1). Since values of T_1 given in BS 8007, which is the code of Practice used in Sri Lanka for design of water retaining structures, are not valid for conditions in Sri Lanka, experimental investigations were carried out to obtain appropriate values of T_1 for local conditions.

Temperature rise in concrete wall panels of 300mm, 500mm and 1000mm thick was monitored using thermocouples across the depth of each panel. A concrete mix with a cement content of 400 kg/m^3 was used. It was found that the T_1 values for local cements with 12 mm plywood formwork are very much smaller than corresponding values given in BS 8007. Based on the test results T_1 values were proposed for cement content of 400 kg/m^3 and 12 mm plywood formwork.

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ACKNOWLEDGEMENTS

I would like to thank Dr. Mrs. Hettiarachchi who encouraged me to involve with this research as a part of MEng. Degree and Sanken Lanka (Pvt) Ltd. for same.

Especially, I thank my project supervisor Dr. S.M.A. Nanayakkara, Senior Lecture, Department of Civil Engineering University of Moratuwa, who gave me both morale and logistical support to successfully carry out this type of research , which is most useful in the Design and Construction of water retaining structures.

I would also like to thank the Civil Engineering Laboratory Staff of University of Moratuwa and the Sanken Lanka's batching plant staff for their assistance in carrying out experimental work.

Lastly, thanks are due to my office staff who gave their support for preparation of the report.

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CONTENTS

Declaration i

Abstract ii

Acknowledgements iii

Contents iv

List of Figures vii

List of Tables viii

List of Appendixices ix

1.0 Introduction 1

1.1 General 1

1.2 Temperature rise in concrete structures 1

1.3 Thermal stresses in concrete structures 2

1.4 Design of water retaining structures against cracking 4

1.5 Objective of study 7

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2.0 Review of the literature 8

2.1 Early - Age Thermal Movements 8

2.1.1 Introduction 8

2.1.2 Basic Mechanism of Early - Age thermal Movements 9

2.1.3 Coefficient of Thermal Expansion 10

2.2. Evaluation of Temperature Rise 11

2.2.1 Section Thickness 12

2.2.2 Effect of Form Work & Insulation 13

2.2.3 Ambient Temperature 14

2.2.4 Concrete Placing Temperature 14

2.2.5 Concrete Mix Proportions 16

2.2.6 Ordinary Portland Cements.....17

2.3 Restraint to Early - Age thermal movement 18
2.3.1 External Restraint 18
2.3.2 Internal Restraint 19
2.3.3 Combined Internal and External Restraint 20
2.4 Tensile Strain Capacity 22
2.4.1 General Principles 22
2.4.2 Effect of Aggregates 23
2.4.3 Other Factors.....24
2.5 Estimating the Like hood of Cracking 24
2.6 Type of cracking and Significance of Cracking 26
2.6.1 Cracks which Affect the Structural Integrity 27
2.6.2 Cracks which Lead to Durability Problems 27
2.6.3 Cracks which Lead to a Malfunction of the structure 28
2.7 Control of Cracking 28
2.7.1 Mix Proportions.....29
2.7.2 Concrete Placing Temperature 30
2.7.2.1 Cooling of Aggregates & water.....30
2.7.2.2 Ambient Temperature 31
2.7.2.3 Cooling the freshly placed concrete 31
2.7.3 Influence of Form work 32
2.7.3.1 Form work material 32
2.7.3.2 Form work striking times 32
2.7.4 Influence of Construction Sequence 33
2.7.5 Provision of Movements Joints 34
2.7.6 Control of Crack widths by Reinforcement 36
2.8 Cracking due to heat of hydration and drying shrinkage in immature concrete 36
2.8.1 Calculation of crack width due to thermal and drying shrinkage based on BS 8007.....36
2.8.2 Fall in Temperature between the hydration peak and ambient (T1) 37

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Electronic Theses & Dissertations
www.lib.mrt.ac.lk

3.0 Experimental Investigation.....39
3.1 Size of the specimen.....39
3.2 Grade of concrete 39
3.3 Measurement of temperature 41
3.4 Test Results 41
3.5 Further experimental investigation 45
3.6 Discussion 47

4.0 Conclusions.....48
References 49
Appendixices 50

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Electronic Theses & Dissertations
www.lib.mrt.ac.lk

LIST OF FIGURES

Fig 01 - Typical cross section of the concrete wall panel 41

Fig 02 - Temperature variation of the 1000 mm thick wall panel 42

Fig 03 - Maximum temperature rise in each test wall panel with respect to ambient temperature 43

Fig 04 - Values of temperature fall (T1) 43

Fig 05 - Cross section of the test specimen 46

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LIST OF TABLES

Table 01 - Comparison of climatic conditions between UK and Sri Lanka 5

Table 02 - Table A2 of BS8007 6

Table 03 - Coefficient of thermal expansion 10

Table 04 - Heat of Hydration of each main components in OPC 17

Table 05 - Limiting temperature changes and differentials to avoid cracking 25

Table 06 - Type of cracking 26

Table 07 - Mix proportions 40

Table 08 - Values of T1 obtained for different wall thicknesses 44

Table 09 - Temperature distribution across the depth of the section 46

Table 10 - Recommended values of T1 48

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LIST OF APPENDIXICES

Appendix 1 - Graphs 1 to 4 50

Appendix 2 - Mix design reports 52

Appendix 3 - Pre - shipment Analysis report of cement 54

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