

TABLE OF CONTENTS

	PAGE
TITLE PAGE	i
ACKNOWLEDGMENTS	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	x
CHAPTER 1 INTRODUCTION	1
1.1 General	1
1.2 Statement of Problem	2
1.3 Objective and Scope of Study	2
CHAPTER 2 LITERATURE REVIEW	4
2.1 The Influence of Heat Reduction on Strength of Concrete	4
2.2 Parameters Influencing Strength Development of Fly Ash Concrete	6
2.3 Modeling of Compressive Strength	7
2.4 Special Concrete	8
CHAPTER 3 CONCEPTS OF MODEL TO PREDICT COMPRESSIVE STRENGTH OF CONCRETE CURED AT ELEVATED TEMPERATURE	9
3.1 General	9
3.2 The Relationship among the Models	9
3.3 Equation for Predicting Compressive Strength of Concrete Cured at Elevated Temperature	10
CHAPTER 4 THEORETICAL CONSIDERATIONS FOR THE EMPIRICAL FUNCTION OF THE AVERAGE DEGREE OF HYDRATION	11
4.1 General	11
4.2 Portland Cement	11
4.3 Hydration of cement	12
4.4 Degree of Hydration Prediction	14
CHAPTER 5 CONCEPTS AND MODEL FOR STRENGTH DEVELOPMENT RATIO OF CONCRETE	28
5.1 General	28
5.2 Strength Development Ratio of Concrete	28
5.3 Strength Development Ratio Model	33
5.4 Summary of Equations	37
CHAPTER 6 EXPERIMENTAL INVESTIATION	39
6.1 Experimental Program	39
6.2 Materials	40
6.3 Moisture Content of Aggregate	41

	PAGE
6.4 Curing of Concrete	41
6.5 Experimental Procedures	41
6.6 Experimental Results	42
CHAPTER 7 MODEL FOR PREDICTING COMPRESSIVE STRENGTH OF SPECIAL CONCRETES	48
7.1 Roller-Compacted Concrete(RCC) and Self-compacting Concrete (SCC)	48
CHAPTER 8 VERIFICATION OF THE COMPRESSIVE STRENGTH MODELS	50
8.1 Verification of the Compressive Strength Model for Conventional Concrete Cured at any Isothermal Temperature	50
8.2 Verification of the Compressive Strength Model for Special Concrete	55
CHAPTER 9 CONCLUSIONS AND RECOMMENDATIONS	58
9.1 Conclusions	58
9.2 Recommendations	58
REFERENCES	60
APPENDIX A	A-1
APPENDIX B	B-1
APPENDIX C	C-1