



AN INVESTIGATION ON SANDWICH LIGHT WEIGHT FERROCEMENT ONE WAY SLABS

By

ISLAM MOHAMED RABIE MAHMOUD

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirement for Degree of
MASTER OF SCIENCE
in
STRUCTURAL ENGINEERING

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Title of Thesis: AN INVESTIGATION ON SANDWITCH LIGHT WEIGHT FERROCEMENT ONE WAY SLABS



Key Words: Sandwich Panel; ferrocement; Stress-Strain; Flexure Capacity.

Summary:

An experimental investigation was conducted on sandwich light weight ferrocement one way slab specimens each of 1200 mm X 600 mm with varying parameters such as slab thickness (8 & 10 mm), number of layers of steel mesh, interface surface condition between layers, and concrete mix. All the slabs were tested under the effect of one line load acts at mid span. The results were investigated in order to discuss the effect of different parameters on cracking propagation, cracking pattern, ultimate deflection, and ultimate failure load. The conclusion of this research may be useful to find solutions for new design techniques and method of constructions.

Dedication

There are a number of people without whom this work might not have been written, and to whom I am greatly thankful. To my mother, her support, encouragement, and constant love have sustained me throughout my life. To my father, Prof. Dr. Mohamed Rabie, for being there for me throughout my entire education and intellectual development.

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Table of Contents

ACKNOWLEDGMENTS.....	I
TABLE OF CONTENTS	II
LIST OF TABLES	VI
LIST OF FIGURES	VII
ABSTRACT.....	X
CHAPTER 1 INTRODUCTION	1
1-1 GENERAL	1
1-2 OBJECTIVE AND SCOPE OF WORK:	2
1-3 THESIS OUTLINE:	3
CHAPTER 2 LITERATURE REVIEW	4
2-1 FERROCEMENT.....	4
2-1-1 Historical background	5
2-2 FERROCEMENT CONSTRUCTION AND COMPOSITION	6
2-2-1 Mortar matrix	6
2-2-2 Reinforcement.....	7
2-2-3 Admixtures	10
2-2-4 Mix-proportioning.....	10
2-2-5 Aggregate.....	10
2-3 MECHANICAL AND PHYSICAL PROPERTIES	11
2-3-1 Behavior under tension.....	11
2-3-2 Ultimate compressive strength.....	14
2-3-3 Ultimate flexural strength	15
2-3-4 Shear strength.....	17
2-3-5 Durability	18
2-3-6 Crack development and leakage.....	19
2-4 STRUCTURAL APPLICATIONS OF FERROCEMENT	19
2-4-1 Tanks and Containers	19
2-4-2 Floors and roofs	19
2-4-3 Heavy duty floors tiles.....	20
2-4-4 Ferrocement buildings	20
2-4-5 Marine applications	21
2-4-6 Irrigation structures	22
CHAPTER 3 EXPERIMENTAL WORK.....	23
3-1 INTRODUCTION:	23
3-2 MATERIALS SPECIFICATIONS:	23
3-2-1 coarse aggregate:.....	23
3-2-2 Fine aggregate:.....	24
3-2-3 Cement:.....	25

3-2-4 Polystyrene (foam):	26
3-2-5 Kemapoxy 165:	26
3-2-6 Properties of steel mesh:	27
3-4 Mixing, Placing, and Curing Method of Specimens:	29
3-4-1 Concrete mix design:	29
3-4-2 Mortar mix design:	30
3-4-2-1 Mix (1):	30
3-4-2-2 Mix (2):	30
3-4-3 Concrete mixing, placing and curing:	31
3-4-4 Mortar mixing, placing and curing:	33
3-4-4-1 Mortar Mix (1):	34
3-4-4-2 Mortar Mix (2):	35
3-5 STEEL FORM MOLDS:	36
3-5 TEST SETUP:	38
3-6 MEASURING INSTRUMENTS:	39
3-6-1 Concrete Deflection:	39
3-6-2 Strain of concrete at compression side:	39
3-6-4 Cracking:	41
CHAPTER 4 EXPERIMENTAL RESULTS	42
4-1 INTRODUCTION:	42
4-2 TEST RESULTS FOR CONTROL SLABS:	42
4-2-1 Specimen S1:	42
4-2-1-1 Mode of failure:	42
4-2-1-2 Load-deflection Relationships:	43
4-2-1-3 Strains in concrete at compression side:	45
4-2-2 Specimen S2:	45
4-2-2-1 Mode of failure:	45
4-2-2-2 load-Deflection Relationships:	46
4-2-2-3 Strains in concrete at compression side:	48
4-3 TEST RESULTS FOR GROUP (1):	48
4-3-1 Specimen A1:	49
4-3-1-1 Mode of failure:	49
4-3-1-2 Load-deflection Relationships:	50
4-3-1-3 Strains in concrete at compression side:	52
4-3-2 Specimen B1:	52
4-3-2-1 Mode of failure:	52
4-3-2-2 Load-deflection Relationships:	54
4-3-2-3 Strains in concrete at compression side:	54
4-3-3 Specimen C1:	55
4-3-3-1 Mode of failure:	55
4-3-3-2 Load-deflection Relationships:	56
4-3-3-1 Strains in concrete at compression side:	57
4-4 TEST RESULTS FOR GROUP (2):	58
4-4-1 Specimen A2:	58
4-4-1-1 Mode of failure:	58
4-4-1-2 Load-deflection Relationships:	59
4-4-1-3 Strains in concrete at compression side:	60
4-4-2 Specimen B2:	61
4-4-2-1 Mode of failure:	61
4-4-2-2 Load-deflection Relationships:	62

4-4-2-3 Strains in concrete at compression side:.....	63
4-4-3 Specimen C2:	64
4-4-3-1 Mode of failure:	64
4-4-2-2 Load-deflection Relationships:.....	65
4-4-3-3 Strains in concrete at compression side:.....	66
4-5 TEST RESULTS FOR GROUP (3):	67
4-5-1 Specimen A3:.....	68
4-5-1-1 Mode of failure:	68
4-5-1-2 Load-deflection Relationships:.....	69
4-5-1-3 Strains in concrete at compression side:.....	71
4-5-2 Specimen B3:	72
4-5-2-1 Mode of failure:	72
4-5-2-2 Load-deflection Relationships:.....	72
4-5-2-3 Strains in concrete at compression side:.....	73
4-5-3 Specimen C3:	74
4-5-3-1 Mode of failure:	74
4-5-2-2 Load-deflection Relationships:.....	75
4-5-3-3 Strains in concrete at compression side:.....	76
4-5 TEST RESULTS FOR GROUP (4):	77
4-5-1 Specimen A4:.....	77
4-5-1-1 Mode of failure:	77
4-5-1-2 Load-deflection Relationships:.....	78
4-5-1-3 Strains in concrete at compression side:.....	80
4-5-2 Specimen B4:	80
4-5-2-1 Mode of failure:	80
4-5-2-2 Load-deflection Relationships:.....	82
4-5-2-3 Strains in concrete at compression side:.....	83
4-5-3 Specimen C4:	83
4-5-3-1 Mode of failure:	83
4-5-2-2 Load-deflection Relationships:.....	85
4-5-3-3 Strains in concrete at compression side:.....	85
4-6 TEST RESULTS FOR GROUP (5):	86
4-6-1 Specimen A5:.....	86
4-6-1-1 Mode of failure:	86
4-6-1-2 Load-deflection Relationships:.....	87
4-6-1-3 Strains in concrete at compression side:.....	89
4-6-2 Specimen B5:	90
4-6-2-1 Mode of failure:	90
4-6-2-2 Load-deflection Relationships:.....	90
4-6-2-3 Strains in concrete at compression side:.....	91
4-6-3 Specimen C5:	92
4-6-3-1 Mode of failure:	92
4-6-2-2 Load-deflection Relationships:.....	93
4-6-3-3 Strains in concrete at compression side:.....	94
CHAPTER 5 DISCUSSION OF EXPERIMENTAL RESULTS	96
5-1 INTRODUCTION:	96
5-2 DISCUSSION OF TEST RESULTS:	96
5-2-1 Cracking behavior of investigated specimens:.....	97
5-2-2 Load-deflection behavior:.....	99
5-2-3 Ductility and energy absorption:	108
5-2-4 Stiffness:	111
CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS	113

6-1	CONCLUSIONS.....	113
6-2	RECOMMENDATIONS.....	114
	REFERENCES.....	115

List of Tables

Table (2.1) The grading of fine aggregate	11
Table (3.1): Properties of Sand and Crushed Dolomite	25
Table (3-2): Cement Test Results	25
Table (3-3) Properties of Polystyrene (PS).....	26
Table (3-4) Properties of kemapoxy 165.....	27
Table (3-5) Details of specimens	29
Table (3-6) Design of The Concrete Mix (per m ³)	29
Table (3-7) Material weights for one cubic meter of mortar cement	30
Table (3-8) Material weights for one cubic meter of mortar cement	30
Table (3-9) Cubes test results after 7 days.....	32
Table (3-10) Cubes test results after 28 days.....	32
Table (3-11) Cubes test results after 7 days.....	34
Table (3-12) Cubes test results after 28days.....	34
Table (3-13) Cubes test results after 7 days.....	35
Table (3-14) Cubes test results after 28days.....	35
Table (5.1) Experimental Results.....	97
Table (5.2) Initial cracking load of specimens and change in initial crack	98
Table (5.3) Ultimate deflection ratio	100
Table (5.4) Initial cracking deflection ratio	100
Table (5.5) Ultimate load ratio.....	105
Table (5.11) The calculated ductility index.....	109
Table (5.12) Area under P-Δ curve.....	110
Table (5.13) Stiffness degradation of specimens	111

List of Figures

Figure (2.1) Typical steel meshes used in ferrocement	9
Figure (2.2) Schematic description of mesh tensile test sample and corresponding stress-strain curve	14
Figure (2.3) Ferrocement slabs and sheds	20
Figure (2.4) Ferrocement building	21
Figure (2.5) Ferrocement marine structure	22
Figure (3.1) Sieve analysis of coarse aggregate.....	24
Figure (3.2) Sieve analysis of fine aggregate	24
Figure (3.3) the geometry of steel mesh	27
Figure (3.7) Concrete mixer.....	32
Figure (3.8) Concrete mixer.....	33
Figure (3.9) Steel form molds	36
Figure (3.10) Casting light weight concrete intermediate layer	37
Figure (3.11) Sandwich slabs specimens.....	37
Figure (3.12) Test setup for all the specimens	38
Figure (3.13) Locations of deflection gauges	39
Figure (3.14) Locations of Strain gauge	40
Figure (3.15) The arrangement of the load cell and the hydraulic jack	40
Figure (4.1) Cracking pattern for specimen S1 from tension side	43
Figure (4.2) Load deflection for specimen S1	44
Figure (4.3) deflection profile for specimen S1	44
Figure (4.4) Load-compressive concrete strain for specimen S1.....	45
Figure (4.5) Cracking pattern for specimen S2 at tension side.	46
Figure (4.6) Load deflection for specimen S2	47
Figure (4.7) Load- central deflection for specimen S2	47
Figure (4.8) Load-compressive concrete strain for specimen S2.....	48
Figure (4.9a) Cracking pattern for specimen A1 from tension side.....	49
Figure (4.9b) Shear Cracking pattern for specimen A1	50
Figure (4.10) Load central deflection for specimen A1	50
Figure (4.11a) deflection profile for tested specimens at cracking load	51
Figure (4.11b) deflection profile for tested specimens ultimate load	51
Figure (4.12) Load-compression concrete strain for specimen A1.....	52
Figure (4.13a) Cracking pattern for specimen B1 from tension side	53
Figure (4.13b) Shear Cracking pattern for specimen B1.....	53
Figure (4.14) Load-central deflection for specimen B1	54
Figure (4.15) Load-compressive concrete strain for specimen B1	55

Figure (4.16a) Cracking pattern for specimen C1 from tension side	56
Figure (4.16b) Shear Cracking pattern for specimen C1	56
Figure (4.17) Load- central deflection for specimen B1	57
Figure (4.18) Load-compressive concrete strain for specimen C1	57
Figure (4.19) Cracking pattern for specimen C1 from tension side.....	58
Figure (4.20) Load- central deflection for specimen A2	59
Figure (4.21a) deflection profile for tested specimens at cracking load	60
Figure (4.21b) deflection profile for tested specimens at ultimate load.....	60
Figure (4.22) Load-compressive concrete strain for specimen A2	61
Figure (4.23) Cracking pattern for specimen B2 at tension side	62
Figure (4.24) Load- central deflection for specimen B2	63
Figure (4.25) Load-compressive concrete strain for specimen B2.....	64
Figure (4.26) Cracking pattern for specimen C2 from tension side.....	65
Figure (4.27) Load central deflection for specimen C2	66
Figure (4.28) Load-compressive concrete strain for specimen C2	67
Figure (4.29) Cracking pattern for specimen A3 from tension side	68
Figure (4.30) Flexure shear cracking pattern for specimen A3	69
Figure (4.31) Load- central deflection for specimen A2	70
Figure (4.32a) deflection profile for tested specimens at cracking load	70
Figure (4.32b) deflection profile for tested specimens at ultimate load.....	71
Figure (4.33) Load-compressive concrete strain for specimen A2	71
Figure (4.34) Cracking pattern for specimen B3 from tension side.....	72
Figure (4.35) Load- central deflection for specimen B2	73
Figure (4.36) Load-compressive concrete strain for specimen B2	74
Figure (4.37) Cracking pattern for specimen C3 from tension side.....	75
Figure (4.38) Load - deflection for specimen C3.....	75
Figure (4.39) Load-compressive concrete strain for specimen C3.....	76
Figure (4.40) Cracking pattern for specimen A4 at tension side	77
Figure (4.41) Flexure shear cracking pattern for specimen A4	78
Figure (4.42) Load - deflection for specimen A4	78
Figure (4.43a) deflection profile for tested specimens at cracking load	79
Figure (4.43b) deflection profile for tested specimens at ultimate load.....	79
Figure (4.44) Load-compressive concrete strain for specimen A4.....	80
Figure (4.45) Cracking pattern for specimen B4 from tension side.....	81
Figure (4.46) Flexure shear cracking pattern for specimen B4	81
Figure (4.47) Load central deflection for specimen B4	82
Figure (4.48) Load-compressive concrete strain for specimen B4	83
Figure (4.49) Cracking pattern for specimen C2 from tension side.....	84
Figure (4.50) Flexure shear cracking pattern for specimen C4	84
Figure (4.51) Load central deflection for specimen C2	85
Figure (4.52) Load-compression concrete strain for specimen C4.....	86
Figure (4.53) Cracking pattern for specimen C1 from tension side.....	87
Figure (4.54) Load central deflection for specimen A5	87
Figure (4.55a) deflection profile for tested specimens at cracking load	88
Figure (4.55b) deflection profile for tested specimens at ultimate load.....	88
Figure (4.56) Load-compressive concrete strain for specimen A5.....	89
Figure (4.57) Cracking pattern for specimen B5 from tension side.....	90
Figure (4.58) Load central deflection for specimen B5	91
Figure (4.59) Load-compressive concrete strain for specimen B2	92
Figure (4.60) Cracking pattern for specimen C5 from tension side.....	93

Figure (4.61) Load- central deflection for specimen C5	94
Figure (4.62) Load-compression concrete strain for specimen C2	95
Figure (5.1) Load-deflection curves.....	99
Figure (5.2) Load-deflection curves for group 2&5.....	101
Figure (5.3) Load-deflection curves for group 2&4.....	102
Figure (5.4) Load-deflection curves for group 1&2.....	103
Figure (5.5) Load-deflection curves for group 2&3.....	104
Figure (5.6) Ultimate capacity of all specimens	104
Figure (5.7) Load-deflection curves for group 2&5.....	105
Figure (5.8) Load-deflection curves for group 2&4.....	106
Figure (5.9) Load-deflection curves for group 1&2.....	107
Figure (5.10) Load-deflection curves for group 2&3.....	108
Figure (5.11) Ductility index of specimens	109
Figure (5.12) Stiffness of specimens.....	112

Abstract

Ferrocement is a form of reinforced concrete which is made of single or multiple layers of mesh and/or small-diameter rods completely infiltrated with or encapsulated in mortar. The mortar matrix usually comprises more than 95 percent of the ferrocement volume and has a great influence on the behavior of the final product.

The durability and serviceability of ferrocement was recognized by engineers and builders throughout the world who endorsed it as suitable and economical material for construction. Recently, extensive research has been carried out on the efficiency and the feasibility of using ferrocement as a repairing material for damaged or partially damaged concrete structural elements and the results were promising.

In this experimental investigation, sandwich light weight ferrocement one way slab specimens each of 1200 mm X 600 mm with varying parameters such as depth of slab (8 & 10 mm), number of layers of weld mesh (0,1), interface surface condition between layers, and concrete mix. All the slabs were tested under the effect of one line load acts at mid span and the results were studied. The effects of different parameters on cracking propagation, cracking pattern, ultimate deflection, ultimate failure load were discussed and evaluated. This is useful to find solutions by searching new design techniques and method of constructions.