



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



HANAA ALY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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Ain Shams University
Faculty of Engineering
Department of Structural Engineering

Stability of Shell Roof Structures under Different Load Types

A THESIS

Submitted in Partial Fulfillment for the Requirements of the Degree of
MASTER OF SCIENCE IN CIVIL ENGINEERING
(STRUCTURAL)

Submitted by

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Bachelor of Science in Civil Engineering

(Structural Engineering)

Faculty of Engineering, Future University in Egypt, 2014

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Cairo, 2021



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STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Doctor of Philosophy in Civil Engineering (Structural Engineering).

The work included in this thesis was carried out by the author in the Department of Structural Engineering, Faculty of Engineering, Ain Shams University, Cairo, Egypt.

No part of this thesis has been submitted for a degree or qualification at any other university or institution.

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DEDICATION

Epecially dedicated

To

Our Holy God

Who guide and never leave me in making this research

My Parents (Father and Mother)

Who will remain a great source of inspiration, support and always encourage me to believe in myself. Without them, i will not be able to succeed in my work

My Dear Brothers and Sisters

For giving me strength to overcome pressure while doing this thesis

To all of you who believed that I can finish the study despite of all the struggles, depression, and stress I experienced in the making of this thesis, I dedicate this work

Mahmoud Aboouf

Feb 2021

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ABSTRACT

Shells are important components of many industrial complexes. Performance of shells due to the extreme loading conditions shows that buckling is the major failure mode in such components. Shells have several applications in engineering structures and most particularly in civil engineering, and mechanical engineering, architecture, aerospace and marine industries.

Although Shells are important components of many industrial complexes, and they are becoming more prominent these days, many researches are required to buckling in shells. The best way to cover this point is the parametric study on stability of shell roof structures under different load types. There are different methods used in these decades the proposed method is not covered yet. During the past decades, several researches have been conducted on the stability of shell roof structures under different load types.

The main purpose of this study is to propose a methodology that the stability of shell roof Structures under different load types. The data used in this research was collected according to theoretical values, model geometry, different loads, and buckling of shell. The models use the finite element method to give recommendations or guidelines to study the stability of shell roof structures under different load types.

A compare between results of analytical model by ANSYS and collector models are used to validate the proposed models. The contribution of this study is to present a reveal that the different load types on shell roof structures can play a noticeable role in creating stress concentration and effect destructively the stability of structures.

Keywords: *Analytical Model; Finite Element Model; Thin-walled shells; Buckling; Parametric study; Different loads*

CONTENTS

CURRICULUM VITAE.....	I
STATEMENT	I
DEDICATION.....	I
ACKNOWLEDGMENT	II
ABSTRACT	III
CONTENTS	IV
LIST OF FIGURES.....	VII
LIST OF TABLES.....	XIV
LIST OF CHARTS.....	XV
CHAPTER (1) – INTRODUCTION.....	1
1.1 Overview	1
1.2 Problem Statement	1
1.3 Thesis Objective	1
1.4 Research Contribution.....	2
1.5 Research Methodology	2
1.6 Thesis Outline	3
CHAPTER (2) - LITERATURE REVIEW	5
2.1 Introduction.....	5
2.2 Shell Roof Structures Background	6
2.3 Different Load Types of Shell Roof Structures Background	12
2.4 Buckling of Shell Roof Structures Background	17
2.5 Stability of Shell Roof Structures under Different Load Types Background	20
2.6 Summary	22
CHAPTER (3) – DATA COLLECTION	23
3.1 Introduction.....	23
3.2 Description of Shell Roof Structures	23
3.3 Material Properties	24
3.4 Geometry And Mechanical Properties of the Shells	25
3.5 Parametric Study Models for the Shells.....	27
3.6 Design Process	31
CHAPTER (4) – ANALYTICAL MODELLING OF SHELL ROOF STRUCTURES	32
4.1 Introduction.....	32
4.2 Finite Elements Method of Analysis	34
4.2.1 General Overview on Finite Elements Method	34
4.2.2 Different Types of Finite Element Techniques	37
4.2.3 Application of FEM	37
4.2.4 Shell Elements	38
4.3 Geometric Nonlinearity	40
4.4 Large Deflection - Small Strain Analysis.....	41
4.5 Material Nonlinearity	41
4.5.1 Von Mises Yield Criterion	42
4.5.2 Modelling of Uniaxial Behaviour in Plasticity.....	42
4.6 Buckling Analysis.....	43
4.7 Types of Adopted Finite Element Techniques	44
CHAPTER (5) – MODEL VERIFICATION AND VALIDATION	46

5.1	Introduction.....	46
5.2	Verification of Finite Model.....	46
5.3	Ansys FE Model.....	47
5.4	The Difference Values between Verification and Ansys Model	48
5.5	Case Study Models for Mesh Sizing	50
	CHAPTER (6) – RESULTS AND DISCUSSION OF ANALYTICAL STUDY	52
6.1	Introduction.....	52
6.2	Comparison between Different Values for R2000 under Vertical Load	52
6.2.1	Critical Buckling Load for R2000-r750 under Vertical Load.....	53
6.2.2	Critical Buckling Load for R2000-r1000 under Vertical Load	56
6.2.3	Critical Buckling Load for R2000-r1500 under Vertical Load	60
6.2.4	Critical Buckling Load for R2000-r1800 under Vertical Load	63
6.2.5	Critical Buckling Load for R2000-r2000 under Vertical Load	67
6.3	Comparison between Different Values for R2000 under Lateral Load	70
6.3.1	Critical Buckling Load for R2000-r750 under Lateral Load	71
6.3.2	Critical Buckling Load for R2000-r1000 under Lateral Load	75
6.3.3	Critical Buckling Load for R2000-r1500 under Lateral Load	78
6.3.4	Critical Buckling Load for R2000-r1800 under Lateral Load	82
6.3.5	Critical Buckling Load for R2000-r2000 under Lateral Load	85
6.4	Comparison between Different Values for R3000 under Vertical Load	89
6.4.1	Critical Buckling Load for R3000-r1150 under Vertical Load	89
6.4.2	Critical Buckling Load for R3000-r1500 under Vertical Load	93
6.4.3	Critical Buckling Load for R3000-r2000 under Vertical Load	96
6.4.4	Critical Buckling Load for R3000-r2500 under Vertical Load	100
6.4.5	Critical Buckling Load for R3000-r3000 under Vertical Load	103
6.5	Comparison between Different Values for R3000 under Lateral Load	107
6.5.1	Critical Buckling Load for R3000-r1150 under Lateral Load	107
6.5.2	Critical Buckling Load for R3000-r1500 under Lateral Load	111
6.5.3	Critical Buckling Load for R3000-r2000 under Lateral Load	114
6.5.4	Critical Buckling Load for R3000-r2500 under Lateral Load	118
6.6	Comparison between Different Values for R4000 under Vertical Load	121
6.6.1	Critical Buckling Load for R4000-r1500 under Vertical Load	122
6.6.2	Critical Buckling Load for R4000-r2000 under Vertical Load	125
6.6.3	Critical Buckling Load for R4000-r2500 under Vertical Load	129
6.6.4	Critical Buckling Load for R4000-r3200 under Vertical Load	132
6.6.5	Critical Buckling Load for R4000-r4000 under Vertical Load	136
6.7	Effect of Elastic Critical Buckling Load for Shells R2000-V	140
6.8	Effect of Elastic Critical Buckling Load for Shells R3000-V	142
6.9	Effect of Elastic Critical Buckling Load for Shells R4000-V	144
6.10	Comparison of Elastic Critical Buckling Load for all Shells under Vertical Load	146
6.11	Effect of Elastic Critical Buckling Load for Shells R2000-L.....	148
6.12	Effect of Elastic Critical Buckling Load for Shells R3000-L.....	150
6.13	Comparison of Elastic Critical Buckling Load for all Shells under Lateral Load	152
6.14	Limitation of Elastic Critical Buckling Load for all Shells under Vertical Load	154

6.15	Limitation of Elastic Critical Buckling Load for all Shells under Lateral Load	155
CHAPTER (7) – CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE WORKS		156
7.1	Introductions	156
7.2	Conclusions.....	156
7.3	Recommendations for Future Work	157
REFERENCES.....		159

LIST OF FIGURES

Figure 3. 1: Parameters to define stress – strain curves	24
Figure 3. 2: Geometry and Properties of the Shells	26
Figure 4. 1: Geometric characteristic of Shell element	39
Figure 4. 2: Force control technique	45
Figure 5. 1: The stresses and deformation of a perfect spherical cap at the critical buckling point by [66]	47
Figure 5. 2: The stresses in MPA from ANSYS model	47
Figure 5. 3: The displacement in mm from ANSYS model	48
Figure 5. 4: Shows the different of mesh sizing from 10mm to 50mm	50
Figure 5. 5: Shows the mesh sizing of 25mm	51
Figure 6. 1: Shows the effect of the thickness on shell form 4mm to 12mm	52
Figure 6. 2: Shows the effect of critical buckling load for R2000-r750-T4-V is 0.99737 MPA	53
Figure 6. 3: Shows the effect of critical buckling load for R2000-r750-T6-V is 2.2532 MPA	53
Figure 6. 4: Shows the effect of critical buckling load for R2000-r750-T8-V is 4.0386 MPA	54
Figure 6. 5: Shows the effect of critical buckling load for R2000-r750-T10-V is 6.3663 MPA	54
Figure 6. 6: Shows the effect of critical buckling load for R2000-r750-T12-V is 9.18445 MPA	55
Figure 6. 7: Shows the effect of the thickness on shell form 4mm to 12mm	56
Figure 6. 8: Shows the effect of critical buckling load for R2000-r1000-T4-V is 0.9819 MPA	56
Figure 6. 9: Shows the effect of critical buckling load for R2000-r1000-T6-V is 2.2107 MPA	57
Figure 6. 10: Shows the effect of critical buckling load for R2000-r1000-T8-V is 3.9425 MPA	57
Figure 6. 11: Shows the effect of critical buckling load for R2000-r1000-T10-V is 6.1907 MPA	58
Figure 6. 12: Shows the effect of critical buckling load for R2000-r1000-T12-V is 8.9219 MPA	58
Figure 6. 13: Shows the effect of the thickness on shell form 4mm to 12mm	59
Figure 6. 14: Shows the effect of critical buckling load for R2000-r1500-T4-V is 0.92297 MPA	60
Figure 6. 15: Shows the effect of critical buckling load for R2000-r1500-T6-V is 2.0948 MPA	60
Figure 6. 16: Shows the effect of critical buckling load for R2000-r1500-T8-V is 3.7534 MPA	61
Figure 6. 17: Shows the effect of critical buckling load for R2000-r1500-T10-V is 5.8885 MPA	61
Figure 6. 18: Shows the effect of critical buckling load for R2000-r1500-T12-V is 8.5384 MPA	62
Figure 6. 19: Shows the effect of the thickness on shell form 4mm to 12mm	63

Figure 6. 20: Shows the effect of critical buckling load for R2000-r1800-T4-V is 0.82718 MPA	63
Figure 6. 21: Shows the effect of critical buckling load for R2000-r1800-T6-V is 1.8876 MPA	64
Figure 6. 22: Shows the effect of critical buckling load for R2000-r1800-T8-V is 3.3962 MPA	64
Figure 6. 23: Shows the effect of critical buckling load for R2000-r1800-T10-V is 5.3611 MPA	65
Figure 6. 24: Shows the effect of critical buckling load for R2000-r1800-T12-V is 7.7899 MPA	65
Figure 6. 25: Shows the effect of the thickness on shell form 4mm to 12mm	66
Figure 6. 26: Shows the effect of critical buckling load for R2000-r2000-T4-V is 0.61185 MPA	67
Figure 6. 27: Shows the effect of critical buckling load for R2000-r2000-T6-V is 1.4074 MPA	67
Figure 6. 28: Shows the effect of critical buckling load for R2000-r2000-T8-V is 2.5479 MPA	68
Figure 6. 29: Shows the effect of critical buckling load for R2000-r2000-T10-V is 4.0431 MPA	68
Figure 6. 30: Shows the effect of critical buckling load for R2000-r2000-T12-V is 5.9007 MPA	69
Figure 6. 31: Shows the effect of radius on shell form 750mm to 2000mm	70
Figure 6. 32: Shows the effect of the thickness on shell form 4mm to 12mm	70
Figure 6. 33: Shows the effect of critical buckling load for R2000-r750-T4-L is 1.8417 MPA	71
Figure 6. 34: Shows the effect of critical buckling load for R2000-r750-T6-L is 4.6561 MPA	72
Figure 6. 35: Shows the effect of critical buckling load for R2000-r750-T8-L is 9.1696 MPA	72
Figure 6. 36: Shows the effect of critical buckling load for R2000-r750-T10-L is 15.727 MPA	73
Figure 6. 37: Shows the effect of critical buckling load for R2000-r750-T12-L is 24.695 MPA	73
Figure 6. 38: Shows the effect of the thickness on shell form 4mm to 12mm	74
Figure 6. 39: Shows the effect of critical buckling load for R2000-r1000-T4-L is 1.181 MPA	75
Figure 6. 40: Shows the effect of critical buckling load for R2000-r1000-T6-L is 2.8806 MPA	75
Figure 6. 41: Shows the effect of critical buckling load for R2000-r1000-T8-L is 5.4942 MPA	76
Figure 6. 42: Shows the effect of critical buckling load for R2000-r1000-T10-L is 9.1465 MPA	76
Figure 6. 43: Shows the effect of critical buckling load for R2000-r1000-T12-L is 13.964 MPA	77
Figure 6. 44: Shows the effect of the thickness on shell form 4mm to 12mm	78
Figure 6. 45: Shows the effect of critical buckling load for R2000-r1500-T4-L is 0.7531 MPA	78