

الآية

قال تعالى:

(قَالَ لَا تَخَافَا ۖ إِنَّنِي مَعَكُمَا أَسْمَعُ وَأَرَىٰ)

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Abstract

In this research, three configurations of water tanks were taken to study structure behavior by using structure analysis programs for different loads cases (dead loads, lives load, wind loads and their combinations).

The analysis results were drawing in graphical presentation in order to study structural behavior of three configurations; it was taken the variation of axial force under effect of wind, variation of axial load produce from configurations self weight and displacement produce from wind for the three configurations.

The allowable stress method and ultimate state design are used for element design of configurations. From comparing result between the three configurations, the third configuration is the best whence of structure behavior.

المستخلص

في هذا البحث ، ثلاثة نماذج من خزانات المياه، أخذت لدراسة لدراسة السلوك الإنشائي باستخدام عدة برامج للتحليل الإنشائي لحالات مختلفة من الأحمال (أحمال ميتة، أحمال حية، أحمال الرياح وتراكيب الأحمال).

نتائج التحليل وضحت في رسومات تخطيطية لكي يدرس السلوك الإنشائي للنماذج الثلاثة، أخذ إختلاف القوى المحورية تحت تأثير الرياح مع إرتفاع الخزانات وإختلاف القوى المحورية الناتجة من أوزان النماذج وكذلك الإنحراف الناتج من الرياح للنماذج الثلاثة. تم إستخدام طريقة المقاومة القصوى والإجهاد المسموح به في تصميم عناصر النماذج. من إختلاف النتائج بين النماذج الثلاثة وجد أن النموذج الثالث هو الأفضل من حيث السلوك الإنشائي.

List of contents

NO	CONTENTS	PAGE
	الآية	I
	Acknowledgement	II
	Abstract	III
	المستخلص	IV
	List of contents	V
	List of tables	IX
	List of figures	XI
	List of symbols	XVI
1.	CHAPTER ONE : INTRODUCTION	
1.1	General	1
1.2	The problem	1
1.3	Scope	1
1.4	Research objectives	1
1.5	Methodology	2
1.6	Organization of research	2
2.	CHAPTER TWO: LITTRATURE REVIEW	
2.1	Introduction	3
2.2	Elevated water tanks	3
2.2.1	Types of elevated tanks	4

2.2.1.1	Rectangular elevated water tanks	4
2.2.1.2	Circular elevated water tanks	5
2.2.1.3	Intz type tank	7
2.2.1.4	Conical or funnel shaped tank	8
2.3	Elevated water tank element	9
2.3.1	Slabs	9
2.3.2	Tank's walls	14
2.3.3	Columns	18
2.3.4	Beams	25
2.3.5	Foundations	27
3.	CHAPTER THREE: THE RESEACH PROBLEM	
3.1	Introduction	33
3.2	Loads applied to water tank	33
3.2.1	Dead load	34
3.2.2	Live load	34
3.2.3	Wind load	35
3.3	Analysis methods	39
3.3.1	Approximated method	39
3.3.2	Computer soft ware's method	42
3.4	Soft weirs used in water tank analysis	43
3.4.1	SAP 2000-V18	43

3.4.2	ETABS-V9.5 Program	43
3.4.3	Safe program	44
3.4.4	Excel Microsoft office	44
3.5	Water tank design method	44
3.6	Crack control	45
3.7	Design procedure for elevated water tanks element	47
3.7.1	Design procedure of one way slab	47
3.7.2	Design procedure for rectangular wall	48
3.7.3	Circular wall design procedure	51
3.7.4	Shear wall design procedure	54
3.7.5	Axial column design procedure	56
3.7.6	Beams design	57
3.7.7	Foundation design procedure	60
3.8	Elevated water tank stability	62
3.9	Loads applied on water tanks	65
3.9.1	Water pressure	65
3.9.2	Wind loads	66
3.9.3	Dead loads	67
3.9.4	Water weight	68
3.10	Load combination	68
3.11	Load calculation for water tanks	68

3.11.1	Wind load calculation	68
3.12	Analysis data for case study	71
3.13	Analysis	74
3.13.1	Approximated Analysis	74
3.13.2	Program analysis	80
3.14	Stability check	121
4.	CHAPTER FOUR: RESEARCH RESULTS AND DISCUSSION	
4.9	Discuss results	124
5.	CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS	
5.1	Conclusions	128
5.2	Recommendations	129
-	References	
-	Appendices	

List of tables

Table	Description	Page
(2.1)	Minimum thickness for deflection	11
(3.1)	External pressure coefficient C_p	36
(3.2)	Wind directionality factor K_d	37
(3.3)	Important factor I	37
(3.4)	Velocity pressure exposure coefficient K_z	38
(3.5)	General data	72
(3.6)	Rectangular water tank data	72
(3.7)	Circular water tank data	73
(3.8)	Approximated analysis for rectangular elevated Tank	75
(3.9)	Approximated analysis for circular elevated tank	78
(3.10)	Rectangular and circular column result	99
(3.11)	Beams and slabs result	99
(3.12)	Circular tank – slabs result	100
(3.13)	Circular tank – walls result	100
(3.14)	Rectangular tank – walls result	100
(3.15)	Circular slab design	101
(3.16)	Rectangular slab design	102
(3.17)	Rectangular slab design	103
(3.18)	Circular slab design	105

(3.19)	Rectangular wall design	106
(3.20)	Circular wall design	109
(3.21)	Rectangular water tank bracing design	111
(3.22)	Rectangular water tank girder beam design	112
(3.23)	Circular water tank bracing design	113
(3.24)	Circular water tank girder beam design	114
(3.25)	Rectangular column design	115
(3.26)	Circular column design	116
(3.27)	Rectangular water tank foundation	118
(3.28)	Circular water tank foundation	119
(4.1)	Approximated method and program result performance	126

List of figures

Figure	Description	Page
(2.1)	Rectangular elevated tank	4
(2.2)	Circular elevated tank	6
(2.3)	Intz elevated tank	8
(2.4)	Conical elevated tank	9
(2.5)	Types of slabs	10
(2.6)	Types of slabs on one structure	11
(2.7)	One way slab	13
(2.8)	One way slab behavior under loading	13
(2.9)	One way slab reinforcement	14
(2.10)	Wall loading and moment diagram	16
(2.11)	Circular wall ring tension	17
(2.12)	Columns shaped and reinforcement	19
(2.13)	Circular and rectangular columns reinforcement shape	21
(2.14)	One piece column ties and lap spliced	23
(2.15)	Column splices details	24
(2.16)	Details of columns end on slab	25
(2.17)	Spandrel joint details	26
(2.18)	Types of foundations	28
(2.19)	Flat single footing	29

(2.20)	Step single footing	29
(2.21)	Sloped single footing	30
(2.22)	Eccentricity load on footing	31
(2.23)	Load on footing without eccentricity	31
(2.24)	Reinforcement of an isolated spread footing	32
(3.1)	Dead load estimation	34
(3.2)	Live load estimation	35
(3.3)	Water weight	35
(3.4)	Wind load effects shape	39
(3.5)	Design flow chart of column	57
(3.6)	Design flow chart of foundation	61
(3.7)	Overturning check	63
(3.8)	Sliding check	64
(3.9)	Hydrostatic pressure in wall of tank	65
(3.10)	Wind load pressure	66
(3.11)	Dead load (self weight)	67
(3.12)	Rectangular elevated water tank – wind pressure	71
(3.13)	Circular elevated water tank – wind pressure	71
(3.14)	Rectangular elevated tank loads and dimensions	74
(3.16)	Circular elevated tank model	80
(3.17)	Rectangular elevated tank model	81

(3.18)	Model of circular elevated tank supporting on wall tower	82
(3.19)	Rectangular elevated water tank – columns axial load due to Wind load	83
(3.20)	Rectangular elevated water tank – columns axial load due to Combination (2)	84
(3.21)	Circular elevated water tank – columns axial load due to Wind load	81
(3.22)	Circular elevated water tank – columns axial load due to Combination (2)	86
(3.23)	Circular elevated water tank – walls axial load due to Combination (2)	87
(3.24)	Rectangular water tank – top slab moment (M11)	88
(3.25)	Rectangular water tank – top slab moment (M22)	88
(3.26)	Rectangular water tank – bottom slab model	89
(3.27)	Rectangular water tank – bottom slab moment (M11)	89
(3.28)	Rectangular water tank – bottom slab moment (M22)	90
(3.29)	Rectangular water tank – top beam moment	90
(3.30)	Rectangular water tank – top beam shear	91
(3.31)	Circular water tank – top slab moment (M11)	91
(3.32)	Circular water tank – top slab moment (M22)	92

(3.33)	Circular water tank – bottom slab model	92
(3.34)	Circular water tank – bottom slab moment (M11)	93
(3.35)	Circular water tank – bottom slab moment (M22)	93
(3.36)	Circular water tank – top beam moment	94
(3.37)	Circular water tank – top beam shear	94
(3.38)	Circular water tank – wall ring tension	95
(3.39)	Circular water tank – walls moment	95
(3.40)	Rectangular water tank – walls moment	96
(3.41)	Rectangular water tank – walls moment	96
(3.42)	Raft foundation soil pressure diagram	97
(3.43)	Raft foundation moment (M11) diagram	97
(3.44)	Raft foundation moment (M22) diagram	98
(3.45)	Raft foundation deformed shape diagram	98
(4.1)	Displacement performance due to wind load	132
(4.2)	Column axial load due to wind load	132
(4.3)	Dead load performance	133
(4.5)	Wall moment performance	134
(4.6)	Slab moment performance	134
(A.1)	Rectangular elevated water tank – columns and bracing Moment due to Wind load	
(A.2)	Rectangular elevated water tank – columns axial load	

	due to Combination (6)
(A.3)	Rectangular elevated water tank – columns axial load due to Combination (6)
(A.4)	Rectangular elevated water tank – columns moments due to Combination (3)
(A.5)	Circular elevated water tank – columns axial load due to Combination (6)
(A.7)	Circular water tank-wall axial due to wind load
(A.8)	Rectangular water tank-plan & elevation
(A.9)	Rectangular water tank-columns & beams structure drawing
(A.10)	Rectangular water tank-Top slab structure drawing
(A.11)	Rectangular water tank-Wall details
(A.12)	Rectangular water tank-Bottom slab structure drawing
(A.13)	Rectangular water tank-Foundation details
(A.14)	Circular water tank-plan & elevation
(A.15)	Circular water tank-Top& bottom slab reinforcement
(A.16)	Circular water tank-Wall reinforcement
(A.17)	Circular water tank-Beam & Columns details
(A.18)	Circular water tank-Foundation details

List of symbols

P_u	Ultimate load
P_n	Nominal load
P_{nmax}	Maximum nominal load
P_w	Working load
M_w	Working moment
M_u	Ultimate moment
d	Effective depth
d_b	Diameter of bar
d_t	Diameter of ties bar
b	Column width
h	Height
B	Width
L	Length
D	Diameter of circular section
e	Eccentricity
$f_{c'}$	Concrete compression strength
f_y	Yield stress
f_c	Stress in concrete
f_s	Stress in reinforcement

E_s	Modules of elasticity for steel
E_c	Modules of elasticity for concrete
n	Constant (with appropriate subscripts)
k	Constant (with appropriate subscripts)
j	Constant (with appropriate subscripts)
T_{max}	Maximum tension
z	quantity limiting distribution of flexural reinforcement
c	Coefficient of shrinkage
A_s	Area of steel reinforcement
A_v	Area of shear reinforcement
A_b	Area of reinforcement bar
s_{max}	Minimum spacing control cracking
s	spacing
h_{min}	Minimum thickness resistance deflection
c_p	External pressure coefficient
k_z	Velocity pressure exposure coefficient
k_{zt}	Topographic factor
k_d	Wind directionality factor
q_{all}	Allowable bearing capacity

q_u	Ultimate bearing capacity
V_u	Ultimate shear force
ϕV_c	Shear force resistance by concrete section
R_u	Resistance factor
R_{urev}	Revised resistance factor
ρ_{min}	Minimum reinforcement ratio
ρ_b	Balance reinforcement ratio
ρ	Reinforcement ratio