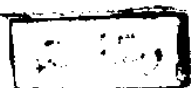


Ain Shams University
Faculty of Engineering

ANALYSIS OF CURVED STEEL BRIDGES

A Thesis submitted in partial fulfillment of the requirements
for the degree of master of science
in Civil Engineering (Structural)



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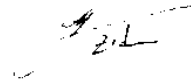
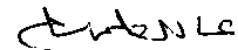
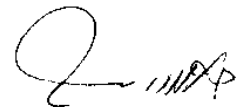


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Statement

This dissertation is submitted to Ain Shams University for the degree of M.Sc. in Civil Engineering.

The work included in this thesis was carried out by the author in the department of Structural Engineering , Ain Shams University

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

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Abstract

The main object of this thesis is to study the effect of the different parameters governing the design of steel curved bridges as well as studying the effect of the different finite element models of idealization on the bridge behavior .A primary study was made to find the minimum requirements to idealize a curved composite steel-concrete beam by the finite element method of analysis. Many idealization models were chosen and their results were compared together and with published theoretical results to find the advantages and disadvantages of every model. The best model chosen for idealizing the girders of the bridge was that which gives the closest solution to the theoretical one. Design formulas and curves have been provided for the bending and warping stresses as well as for deflection distribution factors of the exterior girders. These take into consideration the arc length ,the radius of curvature of the bridges, the number of cross frames (diaphragms), the slab thickness and the girder inertia. Also, an influence surface formula has been provided for the distribution factors of the exterior and interior girders caused by live load moving transversely across the deck and located longitudinally at a point that produces maximum bending moment. A brief summary, discussion of the results and conclusions are given.

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CONTENTS

	page
EXAMINERS COMMITTEE	i
STATEMENT	ii
INFORMATION ABOUT THE RESEARCHER	iii
ABSTRACT	iv
ACKNOWLEDGEMENTS	v
CONTENTS	vi
LIST OF FIGURES	x
LIST OF TABLES	xviii
 CHAPTER (1) INTRODUCTION	 1
1-1 GENERAL	1
1-2 SCOPE ON PREVIOUS INVESTIGATION	2
1-3 SCOPE OF THE PRESENT INVESTIGATION	4
1-4 ORGANIZATION OF THE THESIS	4
 CHAPTER (2) LITERATURE REVIEW	 7
2-1 INTRODUCTION	7
2-2 MODELS OF IDEALIZATION	7
2-2-1 General	7
2-2-2 Model I	8
2-2-3 Model II	9
2-2-4 Model III	9
2-2-5 Model IV	10
2-2-6 Model V	10
2-2-7 Model VI	11
2-3 DESIGN EQUATIONS OF PREVIOUS INVESTIGATION	11
2 3-1 Design equation based on model I	12
2 3-2 The Bishara and Elmir 's model	15
2 3-3 Design equation based on model III	16
2 3-4 Design equation based on model IV	19
2 3-5 Design equation based on model V	20
2-3-6 Design equation based on model VI	24

CHAPTER (3)	VALIDATION OF FINITE ELEMENT PROGRAM	33
3-1	GENERAL	33
3-2	THEORETICAL SOLUTION	34
3-2-1	Straight beams	34
3-2-2	Composite sections	36
3-2-3	Curved beams	37
3-3	MATHEMATICAL MODELS.	39
3-3-1	Model I	39
3-3-2	Model II	39
3-3-3	Model III	40
3-3-4	Model IV	41
3-3-5	Model V	42
3-3-6	Model VI	42
3-3-7	Model VII	43
3-3-8	Model VIII	43
3-4	CASES OF STUDY	43
3-4-1	Straight cantilever beam	43
3-4-1-a	Model II	44
3-4-1-b	Model III	44
3-4-1-c	Model IV	44
3-4-1-d	Model V	45
3-4-2	curved cantilever beam.	46
3-4-2-a	Model III	46
3-4-2-b	Model IV	46
3-4-3	The effect of web stiffeners and its idealization method on both warping and bending stresses of curved girders.	47
3-4-4	Composite section idealization model	47
3-4-4-a	Model VI	48
3-4-4-b	Model VII	48
3-4-4-c	Model VIII	49
3-5	RESULTS AND DISCUSSION	49
3-5-1	straight cantilever beam	49
3-5-1-a	Model II (Truss Idealization Model)	49
3-5-1-b	Model III	50

3-5-1-c Model IV	50
3-5-1-d Model V	51
3-5-2 Curved cantilever beam	52
3-5-2-a Model III	52
3-5-2-b Model IV	52
3-5-2-c Effect of stiffeners	53
3-5-3 Composite section.	53
3-5-3-a Model VI	53
3-5-3-b Model VII	54
3-5-3-c Model VIII	54
3-6 CONCLUSION	54
 CHAPTER (4) FINITE ELEMENT ANALYSIS AND RESULTS	74
4-1 GENERAL	74
4-2 ANALYSIS PROGRAM	75
4-3 FINITE ELEMENT MODEL	75
4-4 BRIDGE CHARACTERISTICS AND PARAMETERS.	76
4-5 LOADING SCHEME	77
4-5-1 Dead loads	77
4-5-2 Live loads	78
4-6 METHOD EMPLOYED	78
4-7 CASES OF STUDY	80
4-7-2 The length to radius ratio	80
4-7-2 The number of braced intervals per span	81
4-7-3 The slab thickness	81
4-7-4 The main girder depth	82
4-7-5 The main girders spacing.	82
4-7-6 The Lateral inertia of flanges	82
4-8 FINITE ELEMENT ANALYSIS RESULTS AND DISCUSSION	83
4-8-1 Length to radius ratio	83
4-8-2 The number of braced intervals per span	88
4-8-3 Main Girder Spacing	89
4-8-4 Slab Thickness	91
4-8-5 The depth of Girders	92

4-8-6 The Flanges width (Lateral inertia of flanges)	92
4-9 PROPOSED EQUATIONS	94
4-9-1 Five girders bridge	94
4-9-2 Four girders bridge	101
4-9-3 Three girders bridge	107
4-10 COMPARISON WITH OTHER INVESTIGATIONS	112
4-10-1 Previous investigation by Chai Hong Yoo	112
4-10-2 Previous investigation by Roger Brockenbrough	116
4-10-3 Previous investigation by Heinz and Jin	117
CHAPTER (5) SUMMARY AND CONCLUSIONS	213
5-1 SUMMARY	213
5-2 CONCLUSIONS	214
5-2-1 Models and idealization	214
5-2-2 Parametric study	215
REFERENCES	218
APPENDIX A BENDING AND TORSIONAL ANALYSIS OF BEAMS	220
A-1 STRAIGHT BEAMS	220
A-1-1 Straight beam subjected to bending moment	220
A-1-2 Straight beam subjected to torsion moment	221
A-2 CURVED BEAMS	224
A-2-1 Notation	224
A-2-2 Differential equations.	226
A-2-3 Explicit solution for cantilever.	226

LIST OF FIGURES

Figure	Title	Page
2-1	Model I of idealization by Heinz and Jin	27
2-2	Model II of idealization by Bishara and Elmir	28
2-3	Model III of idealization by Brockenbrough	28
2-4	Model IV of idealization by Fredrick and Tahrini	29
2-5	Model V of idealization by Yoo and Littrell	31
2-6	Model IV of idealization by Khaleel and Itani	32
3-1	Frame element with 6 degree of freedom	71
3-2	Model III of idealization	71
3-3	Actual I girder to be idealized	71
3-4	Model IV of idealization	72
3-5	Truss idealization of the I girder	72
3-6	Model IV of idealization	73
3-7	Model V of idealization	74
3-8	Model VI of idealization	75
3-9	Model VII of idealization	76
3-10	Model VIII of idealization	77
4-1	Strip section idealization finite element Model	119
4-2	Cross section of composite Strip section	119
4-3	Isometric View of the Finite element Model of the bridge	120
4-4	Typical Cross Section of the investigated bridge	120
4-5	Position of standard truck to produce the maximum positive moment	121
4-6	The effect of L/R ratio on the Load Distribution for five girders bridge	122
4-7	The effect of L/R ratio on the Load Distribution for four girders bridge	123

4-6	The effect of L/R ratio on the Load Distribution for five girders bridge	122
4-7	The effect of L/R ratio on the Load Distribution for four girders bridge	123
4-8	The effect of L/R ratio on the Load Distribution for three girders bridge	124
4-9	The effect of L/R ratio on the influence surface of the bending stresses for 5 girders bridge	125
4-10	The effect of L/R ratio on the influence surface of the bending stresses for 4 girders bridge	126
4-11	The effect of L/R ratio on the influence surface of the bending stresses for 3 girders bridge	127
4-12	The effect of L/R ratio on the influence surface of the warping stresses for 5 girders bridge	128
4-13	The effect of L/R ratio on the influence surface of the warping stresses for 4 girders bridge	129
4-14	The effect of L/R ratio on the influence surface of the warping stresses for 3 girders bridge	130
4-15	The effect of L/R ratio on the influence surface of the deflection for 5 girders bridge	131
4-16	The effect of L/R ratio on the influence surface of the deflection for 4 girders bridge	132
4-17	The effect of L/R ratio on the influence surface of the deflection for 3 girders bridge	133
4-18	The effect of L/R ratio on the bending distribution factor for 5 girders bridge	134
4-19	The effect of L/R ratio on the bending distribution factor for 4 girders bridge	135
4-20	The effect of L/R ratio on the bending distribution factor for 3 girders bridge	136

4-21	The effect of L/R ratio on the warping distribution factor for 5 girders bridge	137
4-22	The effect of L/R ratio on the warping distribution factor for 4 girders bridge	138
4-23	The effect of L/R ratio on the warping distribution factor for 3 girders bridge	139
4-24	The effect of L/R ratio on the deflection distribution factor for 5 girders bridge	140
4-25	The effect of L/R ratio on the deflection distribution factor for 4 girders bridge	141
4-26	The effect of L/R ratio on the deflection distribution factor for 3 girders bridge	142
4-27	The effect of number of braced intervals per span on the bending distribution factor for 5 girders bridge	143
4-28	The effect of number of braced intervals per span on the bending distribution factor for 4 girders bridge	144
4-29	The effect of number of braced intervals per span on the bending distribution factor for 3 girders bridge	145
4-30	The effect of number of braced intervals per span on the warping distribution factor for 3 girders bridge	146
4-31	The effect of number of braced intervals per span on the warping distribution factor for 3 girders bridge	147
4-32	The effect of number of braced intervals per span on the warping distribution factor for 3 girders bridge	148

4-33	The effect of number of braced intervals per span on the deflection distribution factor for 5 girders bridge	149
4-34	The effect of number of braced intervals per span on the deflection distribution factor for 4 girders bridge	150
4-35	The effect of number of braced intervals per span on the deflection distribution factor for 3 girders bridge	151
4-36	The effect of number of braced intervals per span on the bending distribution factor for different L/R ratios for 5 girders bridge	152
4-37	The effect of number of braced intervals per span on the bending distribution factor for different L/R ratios for 4 girders bridge	153
4-38	The effect of number of braced intervals per span on the bending distribution factor for different L/R ratios for 3 girders bridge	154
4-39	The effect of number of braced intervals per span on the warping distribution factor for different L/R ratios for 3 girders bridge	155
4-40	The effect of number of braced intervals per span on the warping distribution factor for different L/R ratios for 3 girders bridge	156
4-41	The effect of number of braced intervals per span on the warping distribution factor for different L/R ratios for 3 girders bridge	157
4-42	The effect of number of braced intervals per span on the deflection distribution factor for different L/R ratios for 5 girders bridge	158