

Dedication

To ...

My father and my mother . . .

To . . .

My brothers and my sister . . .

To . . .

All whom I love . . .

Nahed

Acknowledgements

*First of all thanks for **God** who help me to complete this work.*

I am in great debt for all those who have exert efforts or participate to complete this work in its present copy.

*I would like gratefully thanking my supervisor **Dr.Ali Hussein Mohammed Ali**, who has a major role to fulfill this work as it is in present form with his nice supervision and solving all problems , which I met .*

In particular, great thanks to staff of the SUDANUniversity of Science and Technology for the cooperation and providing a suitable environment for the study.

I also would like to thankKORDOFAN University which offered me the chance for study and its financial supports.

ABSTRACT

Bridges are often used to allow people and vehicles to across a natural obstacle such as a river , valleys, roads or pathways.

This research concluded a process of analysis andre-design of the superstructure of spanbridge which placedin the Northern KORDOFAN State. A bridge deck was analyzed by the method of Grillage analogy, this method consistency of converting the bridge deck structure into a network of rigidly connected beams or into a network of skeletal .

The studywas conductedon the modelby applying the design loads onthe superstructureof the bridgeaccordingto the British standard Code (BS5400), And thenanalyzing theseloads by using manualanalysisand sap2000 computerprogram. Three positions for HB vehicle loading have been studied.

The purpose of thestudyis to obtainthe worstcaseload that givesmaximuminternalforceeach of theshear forcesandbending momentsofthe superstructure of bridge and eventually, conclusions and recommendations have been drawn. Further studies are suggested for future researches.

المخلص

كثيراً ما تستخدم الجسور للسماح للناس والمركبات عبور العائق الطبيعي مثل الانهار والوديان والطرق أو الممرات .

تم تحليل بلاطة الجسر ببرنامج الحاسوب استنادا علي طريقة التحليل (Grillage Analysis)

حيث تقوم هذه الطريقة علي تحويل البلاطة الي شبكة مرتبطة مع بعضها البعض .

تناول هذا البحث عملية اعادة التصميم لأجزاء العلوية لجسر العارضا تبو لاية شمال كردفان .

اجريتا لدراسة علي النموذج وذلك بتطبيق الاحمال علي الأجزاء العلوية للجسر

وفقا لالكود البريطاني (BS5400)

ومن ثم تحليل هذه الاحمال التحليل يدويا وحاسوبيا باستخدام برنامج التحليل

(Sap2000) ومقارنتها بالخرط التصميمية .

تم عمل دراسة ثلاثية موائع تحميل المركبة غير الطبيعية التصميمية (HB) .

الغرض من دراسة هذه الحالات هو الحصول علي أسوأ حالة تحميل تعطي اكبر قوي

داخلية لكل من قويا القص وعزوما الانحناء لعناصر الجسر العلوية.

أخيرا تم وضع خاتمة البحث والتيتحتوي علي خلاصة ماتما الحصول عليها ايضا

وضعتا التوصيات والمقترحات .

List of contents

Topic	Page (NO.)
الآية	i
Dedication	ii
Acknowledgements.....	iii
ABSTRACT.....	iv
الملخص.....	v
Table content	vi
List of notation.....	xi
List of tables	xii
List offigures	xiii

CHAPTER (1)

1Introduction	1
1.1General	1
1.2 Researchproblem	1
1.3 Research objectives	2
1.4 Research organization	2

CHAPTER (2)

2 Literature review	4
2.1 Introduction	4
2.2 Components and elements of bridges	4
2.3 Types of Bridges	5
2.4 History of the bridges.....	5
2.5 Bridges uses.....	6
2.6 Classification of bridges	7
2.6.1 Classification By material	7
2.6.2 Classification by span lengths.....	8
2.6.3 Classification by structural form.....	8
2.6.4 Classification According to the axis.....	13
2.6.5 Classification According to the type of support.....	13
2.6.6 Classification to the status of the floor of the bridge.....	14
2.6.7 Classification According to the vertical clearance.....	14
2.7 Advantages of different types of bridges.....	14
2.8 Elements of bridge	15
2.8.1 Super structure.....	15
2.8.2 Sub structure.....	16

CHAPTER (3)

3 Loading on Bridge.....	18
3.1 Primary design of the bridge.....	18
3.2 The final design of the bridge.....	23
3.3 Method of analysis	25
3.3.1 Line Beam	25
3.3.2Yield Line	25
3.3.3 Distribution Coefficients	26
3.3.4 Grillage Analysis.....	26
3.3.5Finite Element	30
3.3.6 Non-linear finite element	31
3.3.7 Finite Strip	31
3.4 Loading on bridge	32
3.5 Classification of loads	36
3.6 Loads applicable to all bridges	41

CHAPTER (4)

4 Analysis and Design.....	53
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4.1 Analysis and structural design.....	53
4.2 Location of the Bridge	53
4.3 Manual analysis	55
4.3.1 Loading calculation	55
4.3.2 Analysis of slab	57
4.3.3 Design of slab.....	58
4.4 Analysis by Sap.....	61
4.4.1 Methodology.....	61
4.4.2 Load patter values.....	62
4.4.3 Load cases and load combinations.....	70
4.5 Design of Girders	73

CHAPTER (5)

5 Results&discussion of results	78
5.1 General	78
5.2 Results of case studied.....	78
5.3 Comparison of obtained results with original design	80
5.4. By comparing between two results observed the following.....	81

CHAPTER (6)

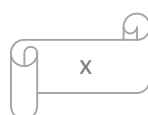
6 Conclusions & Recommendations	82
6.1 Conclusions	82
6.2 Recommendations	83

References

Appendices

Appendix (A) : Sap2000 Program output data

Appendix (B) : The original design sheets.



LIST OF NOTATION

Notation	Title	Page No
HA	Normal traffic	55
HB	Abnormal vehicle unit loading	55
UDL	Uniformly distributed load	55
KEL	Knife edge load combined	55
DL	Dead load	55
SIDL	Super imposed dead load	55
β_i	Lane factor	56
b_l	Notional lane width	56
U_D	Ultimate design load	57
M_{UD}	Moment design load	57
M_L	Maximum bending moment	57
M_{UL}	Ultimate maximum bending moment	57
M_U	Total bending moment	57
f_{cu}	Compressive strength of concrete	58
f_y	Tensile strength of reinforcement.	58
A_s	Area of steal	58
b	Width of slab	58
d	Effective depth	58
P	Single wheel load	59
Z	Lever arm	74
v_c	Critical shear	75
L_e	Basic span	76
δ	Deflection	76

LIST OF TABLES

Table	Title	Page No
(3.1)	Number of notional lanes	33
(3.2)	Load factors	38
(3.3)	HA lane factors	45
(4.1)	Load cases	70
(4.2)	Load combinations	70
(4.3)	Analysis results due to HA	71
(4.4)	Analysis results due to HB position (1)	71
(4.5)	Analysis results due to HB position (2)	72
(4.6)	Analysis results due to HB position (3)	72
(5.1)	Max obtained results of HA alone	79
(5.2)	Max obtained results of (HA + HB) Loading	79
(5.3)	Compression of obtained results and original design	80

LIST OF FIGURES

Fig.	Title	Page No
Fig. (2.1)	Components and elements of bridges	5
Fig.(2.2)	Beam Bridge	9
Fig. (2.3)	Arch Bridge	10
Fig. (2.4)	Truss Bridge	11
Fig. (2.5)	Suspension Bridges	11
Fig. (2.6)	Cable-stayed bridge	12
Fig. (2.7)	Floating Bridge	13
Fig. (3.1)	Voided Slab bridges	20
Fig. (3.2)	T- Section Bridges	21
Fig. (3.3)	box girder bridges	22
Fig. (3.4)	Line beam method	25
Fig. (3.5)	Yield Line method	26
Fig. (3.6)	Grillage idealization of a slab	28
Fig. (3.7)	Highway carriageway and traffic lanes	34
Fig. (3.8)	Highway carriageway and traffic lanes (concluded)	35
Fig. (3.9)	Loading curve for HA, uniformly distributed load, UDL	42
Fig.(3.10)	Dispersion area of wheel	43
Fig. (3.11)	Dimensions of HB vehicle	43
Fig. (3.12)	Loaded length for each lane	45
Fig. (3.13)	Types (HA + HB)loading case (1)	46
Fig. (3.14)	Types (HA + HB)loading case (2a)	47
Fig. (3.15)	Types (HA + HB)loading case(2b)	48
Fig. (3.16)	The Helgeland Bridge	50

