

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGMENT	iv
CHAPTER ONE: INTROUDUCTION	
1.1- General	1-1
1.2- Aims for Research	1-3
1.3- Scope of Research	1-4
1.4 - Literature Review	1-5
1.5- Overview of Study	1-11
CHAPTER TWO: STRUT PURLINS IN DESGN CODES	
2.1: Introduction	2-1
2.2: AISI Code	2-1
2.2.1: Axial Strength	2-1
2.2.2: Flexural Strength	2-3
2.2.3: Combined Axial and Flexural Strength	2-5
2.3: EUROCODE3	2-7
2.3.1: The Material Strength Criteria	2-13
2.3.1: Stability of the Member Against Buckling	2-16
2.4 Comparison between AISI and Eurocode3	2-19

CHAPTER THREE: COMPUTER MODELING

3.1: Introduction	3-1
3.2: Finite Element Model (FEM)	3-3
3.2.1 Boundary conditions	3-6
3.2.2 Load application	3-8
3.3: Finite Element Verification	3-9
3.3.1 Columns	3-10
3.3.2 Beam	3-13
3.3.3 Beam-column	3-17
3.4: Results of Computer Modeling	3-22

CHAPTER FOUR: RESULTS, DISCUSSION, AND COMPARISON

4.1 Introduction	4-1
4.2: Parametric Study	4-1
4.2.1 Eigen analysis	4-2
4.2.2 Nonlinear analysis	4-3
4.3 Effect of Deck or Sheeting	4-4
4.4 The Effect of Tie Rods	4-6
4.5 Finite Element versus AISI	4-11
4.5.1 Axially Loaded Members	4-12
4.5.2 Flexurally Loaded Members	4-21
4.6 Finite Element versus Eurocode3	4-30

4.6.1 Axially Loaded Members	4-30
4.6.2 Flexurally Loaded Members	4-39
4.7 Nonlinear Finite Element analysis	4-48
4.8 Interaction of Axial load and flexural load	4-52
 CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	
5.1- Summary	5-1
5.2- Conclusions	5-2
5.3- Recommendations	5-5
 References	 R-1
APPENDIX A: Test Matrix	A-1
APPENDIX B: Finite Element Model Test Results	B-1
APPENDIX C: Sample Calculation	C-1
APPENDIX D: Rotational Stiffness Tests	D-1