

Table of Contents

ABSTRACT

ACKNOWLEDGEMENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1 INTRODUCTION	1
1.1. DISPLACEMENT BASED OPTIMIZATION AS AN ALTERNATIVE FORMULATION TO STRUCTURAL OPTIMIZATION PROBLEMS	1
1.2. BACKGROUND TO TRUSS SIZING WITH MATERIAL NONLINEARITY	5
1.3. SUMMARY OF THESIS	8
CHAPTER 2 TRUSS SIZING WITH MATERIAL NONLINEARITY VIA DISPLACEMENT BASED OPTIMIZATION	9
2.1. FORMULATION OF INNER AND OUTER PROBLEMS	10
2.2. HOLONOMIC ELASTOPLASTIC LAWS	16
2.3. SCALING OF DISPLACEMENT VARIABLES	18
2.4. ANALYTICAL GRADIENT	19

CHAPTER 3	NUMERICAL EXAMPLES	22
3.1.	THREE-BAR TRUSS	24
3.2.	SIX-BAR TRUSS	28
3.3.	TEN-BAR TRUSS	33
3.3.1.	10-BAR TRUSS: LINEAR ELASTIC CASES	34
3.3.2.	10-BAR TRUSS: ELASTIC-PERFECTLY-PLASTIC CASES	36
3.3.3.	10-BAR: LINEAR STRAIN HARDENING AND RAMBERG-OSGOOD MODEL CASES	39
3.4.	128-BAR TRUSS	43
CHAPTER 4	CONCLUDING REMARKS	50
4.1.	CONCLUSIONS	50
4.2.	FUTURE PERSPECTIVES	51
REFERENCES		53
VITAE		