

## TABLE OF CONTENTS

THESIS.....	i
HALAMAN PENGESAHAN .....	ii
HALAMAN PERSETUJUAN .....	iii
HALAMAN PERNYATAAN .....	iv
ACKNOWLEDGEMENTS .....	v
TABLE OF CONTENTS .....	vi
LIST OF TABLES .....	ix
LIST OF FIGURES .....	x
ABSTRACT.....	xi
CHAPTER I INTRODUCTION.....	1
1.1 Background .....	1
1.2 Problem Identification.....	2
1.3 Research Focus.....	2
1.4 Problem Scope .....	2
1.5 Research Benefit .....	2
CHAPTER II LITERATURE REVIEW .....	3
2.1 Flood Mitigation.....	3
2.1.1 Structural mitigation .....	3
2.1.2 Non-structural mitigation.....	3
2.2 Water Flood Management .....	3
2.2.1 Hydrologic Engineering Center - River Analysis System (HEC-RAS) .....	3
2.2.2 Storm Water Management Model (SWMM) .....	4
2.2.3 Two-dimensional Unsteady Flow (TUFlow).....	4
2.2.4 DELFT3D .....	4
2.2.5 Personal Computer Storm Water Management Model (PCSWMM).....	5
2.3 Urban Hydrology .....	5
2.3.1 Hydrologic modelling in urban areas.....	5
2.3.2 Storm water management strategies .....	5
2.4 Flood Mitigation.....	6
2.4.1 Bio-retention cell .....	6
2.4.2 Rain Garden .....	6
2.4.3 Green roof.....	7

2.4.4	Infiltration trench .....	7
2.4.5	Permeable pavement .....	8
2.4.6	Rain barrel.....	8
2.4.7	Rooftop disconnection .....	8
2.4.8	Vegetative swale .....	9
2.5	Previous Research .....	9
CHAPTER III THEORETICAL FRAMEWORK.....		11
3.1	Hydrologic Analysis.....	11
3.1.1	Design rainfall.....	11
3.1.2	Hourly rainfall distribution pattern .....	12
3.2	Water Flood Management .....	13
3.3	Rain Garden Design .....	14
CHAPTER IV METHODOLOGY .....		16
4.1	Study Area.....	16
4.2	Data Collection.....	16
4.2.1	Spatial data.....	16
4.2.2	Hydrologic data.....	17
4.2.3	Hydraulics data .....	17
4.3	Flowchart.....	17
4.4	Hydrologic Analysis.....	19
4.4.1	Design rainfall.....	19
4.4.2	Hourly rainfall distribution pattern .....	19
4.5	Computational Method.....	19
4.5.1	Surface runoff .....	19
4.5.2	Flow routing.....	20
4.5.3	Infiltration .....	21
4.6	Hydraulic Model .....	23
4.6.1	Existing flood.....	23
4.6.2	Model error evaluation.....	27
4.6.3	Water flood management .....	27
CHAPTER V RESULTS AND DISCUSSION .....		31
5.1	Hydrologic Analysis.....	31
5.1.1	Rainfall data.....	31
5.1.2	Design rainfall.....	31

5.1.3	Rainfall distribution pattern .....	32
5.2	Hydraulic Model .....	33
5.2.1	Existing flood.....	33
5.2.2	Clibration and validation model .....	36
5.2.3	Advanced model .....	38
CHAPTER VI CONCLUSION AND SUGGESTIONS.....		43
6.1	Conclusion.....	43
6.2	Suggestions .....	43
REFERENCES .....		44
APPENDICES .....		47