

TABLE OF CONTENTS

Executive Summary	3
Introduction and Building Overview	5
Current Building Design Review	6
Structural System	6
Gravity System	
Lateral System	
Building Architecture	9
Floorplan	
Façade	
Lighting and Electrical	9
Plumbing	9
Fire Protection	10
Foundation	10
Proposal and Scope of Design.	11
Problem Statement	11
Design Approach	11
Assumptions	11
Methods of Evaluation	12
Depth Analysis: Concrete Design	13
Two-Way Floor Slab	13
Alternatives	
Procedure	
Findings, Direct Design Method	
Findings, ADOSS Analysis	
Superimposed Dead Loads	
Undulating Parking Structure	
Final Design Summary	
Lateral System Design	21
Alternatives	
Procedure	
Analysis Findings	
Column Design	24
Procedure	
Analysis Findings	
Effects on Foundation System	26
Procedure	
Analysis Findings	
Final Concrete Designs	27

TABLE OF CONTENTS, CONTINUED

Breadth Analysis 1: Architecture of Concrete System	30
Floorplan	30
Existing Architecture Problem	
Proposed Solutions	
Exterior Façade	36
Existing Architecture Problem	
Proposed Solutions	
Breadth Analysis 2: Construction Management Comparison	38
Basis of Comparison	38
Cost and Schedule Comparison	38
Additional Construction Considerations for the Washington DC Area . . .	39
Cost Adjustments in Northern Virginia	
Lead Times	
Supply and Demand	
Weather Conditions and Schedule	
Breadth Analysis 3: Integration of a Green Roof	41
Overview of Green Roof Types.	41
Feasibility of a Green Roof	41
Selection of a Green Roof	
Structural Considerations	
Mechanical Considerations	
Acoustic Considerations	
Architectural Considerations	
Cost Considerations	
Conclusions and Recommendations	45
Design Summary	45
Evaluation of the Concrete System	46
Evaluation of the Composite Steel System	47
Final Recommendations	48
Tables and Figures	49
References	51
Acknowledgments	52
Appendix A: Load Calculations	53
Appendix B: Concrete Floor System Calculations.	56
Appendix C: Takeoff Info and Means References.	53
Appendix D: Hand Steel Calculations.	53