

Sweetwater Creek Flood Risk Management Feasibility Study

Cost Engineering Appendix
US Army Corps of Engineers
Mobile District

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Sweetwater Creek FRM Feasibility Report
Cost Appendix

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1. INTRODUCTION

The purpose of this study is to quantify flood risks and related flooding issues associated with the Sweetwater Creek Watershed, located in northwest Georgia, and to evaluate potential measures that may help reduce that risk. The purpose of this appendix is to present and document the detailed cost estimate prepared in support of the study. The goal of the estimate is to provide a reliable basis for authorizing and budgeting the recommended plan, as well as provide a basis reliable basis for comparing costs of the array of alternatives analyzed. The construction cost estimates in this report were developed to Class 4 based on the level of design for the alternatives analyzed.

2. DESCRIPTION OF ALTERNATIVES

The final array of alternatives included both structural and non-structural measures. The non-structural measure consisted of buy-outs of properties located in flood prone areas, with the different alternatives being different levels of buyouts. The buy-outs would also include demolition and removal of the bought structure. The remaining alternatives were comprised of structural measures. These measures included construction of retention structures or modification of the Sweetwater Creek Channel. Table 1 shows the final array of alternatives and indicates the measures included in each alternative. For a full description of each alternative, please refer to the main report. For a full description of the structural measures, please refer to the Engineering Appendix.

Table 1: Alternatives Array

Alternative	Description	Measures
Alternative 1	10% ACE Level Buyouts	Buyouts
Alternative 1.1	4% ACE Level Buyouts	Buyouts
Alternative 1.2	2% ACE Level Buyouts	Buyouts
Alternative 1.3	1% ACE Level Buyouts	Buyouts
Alternative 2	Retention structure at Brown Road	SC6
Alternative 4	Channel Modification	SC9
Alternative 5D	Multibasin Retention	MC2, MC5, OC1, PC2, SC1, SC2, SC6
Alternative 5F	Multibasin Retention	SC1, SC2, SC6
Alternative 5H	Multibasin Retention	SC1, SC6
Alternative 5I	Retention structure upstream of Bakers Bridge Road	SC1
Alternative 5J	Retention structure upstream of Bakers Bridge Road	SC1s

3. FORMULATION OF ALTERNATIVE ESTIMATES

A. PRICE LEVEL

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The estimated cost for each structural alternative consists of the estimated construction, including demolition, cost, the real estate cost, the Planning, Engineering, and Design(PED) cost, the Construction Management(CM) cost, and a contingency. The estimated cost for each non-structural alternative consists of the demolition costs, the real estate costs, and a contingency. PED and CM were not included for the non-structural alternatives. The price level for each alternative was set to 1st Quarter FY 2018, when the estimates were developed.

B. COST ESTIMATE STRUCTURE

The cost estimate for each alternative consists of multiple parts. The below paragraphs describe the structure of the estimates.

The construction cost of the structural alternatives was prepared using MCACES, 2nd generation (MII). MII cost book prices were used except as noted in the MII estimate, as modified by local wage rates (custom Labor Library) and equipment rates (2016 Region III Equipment Library). Markups were applied in MII to bring the estimate to FY 18 price levels, but escalation was not applied to the estimates. PED and CM costs were calculated as a percentage of the construction costs. PED and CM costs were calculated as a percentage of the construction costs. An upper limit was placed on the PED costs, to more accurately reflect the design effort necessary for large cost projects. An Abbreviated Risk Analysis (ARA) was prepared for each type of structural measure being analyzed and a contingency was calculated based on the appropriate ARA was included. The estimated real estate costs, with contingency, were then added to determine a total estimate for each alternative.

For the non-structural alternatives, MII was not used. Since the only construction cost would be the demolition and removal of the existing structures on the areas to be bought, an average cost for demolition and removal was used. A cursory review of the list of structures provided by the Real Estate team indicated the quantity of structures well above the average size. For the purposes of estimating the demolition cost, these structures were counted as two. For example, the selected plan contains 20 parcels, but the estimate accounts for demolition of 25 structures.

C. COST ESTIMATE PRESENTATION

The construction cost estimates were combined with the Real Estate costs, contingency costs, PED costs, and CM costs using an EXCEL workbook. The total cost for each alternative was shared with the PDT for use in selecting a plan. The summary sheet is included as Table 2: Alternatives Estimated Costs These costs were used for the economic analysis for each alternative.

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Table 2: Alternatives Estimated Costs

DESCRIPTION	ESTIMATED AMOUNT
<i>Alternatives</i>	<i>Project Cost</i>
1 Relocations - 10% ACE	\$ 4,669,100
1.1 Relocations - 4% ACE	\$ 5,674,100
1.2 Relocations - 2% ACE	\$ 15,708,300
1.3 Relocations - 1% ACE	\$ 23,028,400
2 Retention Structure at Brown Road	\$ 22,653,000
3 Channel Modification	\$ 134,178,600
4 Multibasin Retention	\$ 33,141,000
5 Multibasin Retention	\$ 152,267,600
6Short Retention Structure Upstream of Bakers Bridge Road	\$ 8,631,000

Notes:

Price Level, FY-18

D. RISK ANALYSIS AND CONTINGENCY

For the alternatives an Abbreviated Risk Analysis (ARA) was prepared for each type of structural alternative. The ARAs were prepared with input from the PDT on developing the risks and assigning likelihood and impact of each risk. The Risk Register for each structural alternative is included as an attachment to this appendix. For the nonstructural alternatives, an across the board contingency of 25% was applied to equal the contingency applied by the Real Estate team on the Real Estate costs. As the study progresses, an ARA will be developed for the selected plan to insure the most accurate description of the risks and contingencies is made.

4. DEVELOPMENT OF ESTIMATED SCHEDULE A. STRUCTURAL ALTERNATIVES SCHEDULES

For the structural alternatives, the MII estimate was used as the basis of schedule. For alternatives with multiple locations, concurrent work at different sites was included in the estimated schedule to an appropriate degree. The resulting schedules are included in

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the estimate workbook and were used by the PDT for the economic analysis of the alternatives.

B. NONSTRUCTURAL ALTERNATIVES SCHEDULES

For the nonstructural alternatives, the Real Estate team was consulted to help develop a timeline for acquisition of the parcels in each alternative. The estimated schedule assumes that demolition of the structures would occur immediately after the acquisition of each parcel, therefore the construction duration would be essentially the same as the acquisition schedule. The resulting schedules are included in the estimate workbook and were used by the PDT for the economic analysis of the alternatives.

5. TENTATIVELY SELECTED PLAN

Alternative 1, relocations and structure removal up to the 10% Annual Chance of Exceedance level, was determined to be the NED plan. Please refer to the main report or Real Estate Appendix for additional information on the TSP.

6. ATTACHMENTS

MII Summary
ARA Risk Registers