



**US Army Corps
of Engineers®**

APPENDIX B: COST ENGINEERING

WACCAMAW RIVER,

HORRY COUNTY, SOUTH CAROLINA

**FLOOD RISK MANAGEMENT STUDY INTEGRATED
FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT**

MAY 2026

MAIN REPORT SUMMARY

The Integrated Feasibility Report and Environmental Assessment (FR/EA), that this appendix addresses, details a collaborative study by the U.S. Army Corps of Engineers (USACE) and Horry County, South Carolina. It is aimed at reducing existing and future flood risks to communities and transportation infrastructure within the Waccamaw River Basin, with a focus on Horry County. The study identifies four key flood impact areas: Longs & Red Bluff, Conway, Bucksport, and Socastee.

The flood impacts in each of these areas were independent of each other, so solutions could be evaluated self-reliantly, making any proposed alternative plans separable. The study considered a range of structural, non-structural, and nature-based solutions while incorporating public feedback gathered during meetings. An environmental analysis was completed, and a Finding of No Significant Impact is included within the main report. The document completed a public review and comment period while also undergoing internal agency reviews and adapted to those concerns and suggestions. In addition to historical flooding, the report acknowledges the flooding event caused by Hurricane Debby in August 2024 during this study, and its impact was assessed to further inform the study's conclusions.

The Recommended Plan, based on an evaluation of alternatives, includes two separable elements that are incrementally justified: Relief Bridges (cross drains) in the Conway flood impact area and Barrier Removal in the Socastee flood impact area. The Recommended Plan is classified as the National Economic Development Plan and is also the plan that maximizes net comprehensive benefits. No alternatives were justified for Federal investment in the Longs & Red Bluff and Bucksport flood impact areas. This Appendix provides detailed Cost Engineering information to support these recommendations.

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A CLASSIFICATION OF ESTIMATE AND EXPECTED ACCURACY

Alternative screening costs within this study have been prepared to an Estimate Class 5 Concept Screening level of accuracy per AACE International Recommended Practice No. 56R-08 (see Table 1; also similar to ASTM E 2516-06, Standard Classification for Cost Estimate Classification System). These costs are intended to inform Alternative selection and early budget planning purposes. The Recommended Plan cost estimates are Class 3 Budget Authorization or Control.

Table A-1: AACE International Recommended Practice No. 56R-08¹

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic			
	LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	END USE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges	PREPARATION EFFORT Typical degree of effort relative to least cost index of 1
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

B CONSTRUCTION COST ESTIMATE:

The following methodology is used in the preparation of the cost estimate for the Waccamaw River Feasibility Study:

- The estimate is in accordance with the guidance contained in ER 1110-2-1302, Civil Works Cost Engineering.
 - The estimate is presented in Civil works Work Breakdown Structure.
- The price level for the estimate is in 1st Quarter of FY2026.

¹ Source: www.aacei.org.

- Construction costs developed by the General Engineering Branch, Engineering Division, Charleston District are based on a 35% design developed by the Civil Engineering team. See Appendix A3 for the methods of construction and quantities. Unit costs are developed using the M-CACES Second Generation (Mii) software containing the 2025 English Cost Book Library which was used as a starting point. Historical cost data from similar projects are used for parametric estimate, and vendor quotes were used for non-Cost Book data. The estimate is documented with notes to explain the assumed construction methods, crews, productivity, and other specific information. The intent is to provide or convey a “fair and reasonable” estimate which depicts the local market conditions.
- Labor costs are based on the 2025 R.S. Means Charleston, SC Labor Rates plus a 15% increase.
- Bid competition: No contracting plan is made at this point. Bidding competition is assumed to be unrestricted since the overall work is typical of the area and the massive size of the project will likely draw multiple national level large size contractors to bid on the project. This assessment is reflected in the Abbreviated Risk Analysis.
- Contract Acquisition Strategy: Acquisition strategy is not yet determined at this point. However, to reflect the historical market conditions for this type of work, Prime Contractor is assumed to perform minimal earth work and will sub-contract out all remaining work.
- Labor Shortages: It is assumed that there will be a normal labor market
- Materials: Most material costs are from the Cost Book Library. Vendor quotes were used for non-Cost Book items. Assumptions include:
 - Rent materials will be part of the construction contract. No government furnished materials are assumed. Quoted delivery charge is used for hauling cost.
 - Materials will be rented from local nearest available sources.
 - Hauling: Most hauling will be done by trucks. For trucking, it is assumed that the average speed is 30 mph, factoring traffic hours in often congested major routes.
 - Equipment: Rates used are based on the latest USACE EP-1110-1-8, Region III. Adjustments are made for fuel and facility capital cost of money (FCCM). Judicious use of owned versus rental rates was considered based on typical contractor usage and local equipment availability. Full FCCM/Cost of Money rate is latest available; Mii program takes EP recommended discount; no other adjustments have been made to the FCCM.
 - Fuels (gasoline, on and off-road diesel) were based on local market averages for on- road and off-road fuels in Horry County, SC. Since fuels fluctuate irrationally, an average was used.
 - Major crew and productivity rates were developed and studied by senior USACE estimators familiar with the type of work. All of the work is typical of the Charleston District. The crews and productivities were checked by local SAC estimators, discussions with contractors and comparisons with historical cost data.
- Most crew work hours are assumed to be 8 hrs. 5 days/week, which is typical of the area. It is anticipated that no overtime is required for reasons such as time of year restriction because there is none.

- Mobilization and demobilization: Contractor mobilization and demobilization are based on the assumption that most of the contractors will take about one 8 hr day to mobilize and one 8 hr day to demobilize. Mob. and demob. cost is estimated from 1% to 5% of total construction costs depending on the size of work.
- Field Office Overhead: Typically, civil works project has field office overhead ranging from 10% to 20%. 20% was used for Job Office Overhead. Overhead assumptions may include: Superintendent, office manager, pickups, periodic travel, costs, communications, temporary offices (contractor and government), office furniture, office supplies, computers and software, as-built drawings and minor designs, tool trailers, staging setup, camp and kitchen maintenance and utilities, utility service, toilets, safety equipment, security and fencing, small hand and power tools, project signs, traffic control, surveys, temp fuel tank station, generators, compressors, lighting, and minor miscellaneous.
- Home Office Overhead: Due to the size of project, a typical percentage was used (10%) for HOOH. The rates are based upon estimating and negotiating experience, and consultation with local construction representatives.
- Profit: Since the Construction Cost Estimate is currently in a budgetary phase, profit is typically included at 10% for Prime Contractor. Sub-contractors' profit is also 10%.
- Sales Tax: State sales tax was applied at 6% plus 2% local sales tax. A total of 8% was included in the estimate.
 - Bond: Bond is calculated at 1.5% in Mii for the Prime contractor.
 - Contingency: Contingency will not be included in the Mii cost estimate. Contingency will be applied on the TPCS based on the outcome of the ARA's done for each alternative selected as part of the recommended plan.
 - Escalation: No escalation to midpoint of construction according to tentative construction start dates is included in the Mii estimate and non-Mii estimates provided by SAC. Escalation will only be included in the Total Project Cost Summary (TPCS) to avoid duplicates.
- Real Estate (RE): Costs were developed and provided by the Realty Specialist and placed in WBS-01 Lands and Damages. The RE cost for each alternative includes land costs, acquisition costs, and contingencies.
- Planning, Engineering, and Design (PED): No PED cost have been included in the Mii estimate. PED cost will only be included in the Total Project Cost Summary (TPCS) to avoid duplicates.
- Supervision and Administration (S&A): No S&A cost have been included in the Mii estimate. S&A will only be included in the Total Project Cost Summary (TPCS) to avoid duplicates.

ATTACHMENTS

Cost Attachment 1: Final Mii Printout (MAR26).pdf Output from Mii estimating software

Cost Attachment 2: Cost MCX ATR Cert for SAC – P2 493919 – Waccamaw River FRM – 2026-03-25.pdf Cost Certification