



US Army Corps
of Engineers



Lower Missouri Jefferson City L-142 Flood Risk Management Study

Draft Integrated Feasibility Report and Environmental Assessment

Appendix B - Cost Engineering

July 2026



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

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1.0 Project Description

The project consists of various measures to manage flood risk and bank protection in Jefferson City, MO. The measures included in the current plan are indicated in Table B-1.

Table B-1 Major Project Features

Flood Risk Management Measure	Description
Levee Setback	A new levee with stability and underseepage berms will be constructed further back from the existing Capital View levee. Portions of the Capital View levee will be removed to facilitate new levee construction while other portions will be left in place.
Closure Structure	Stoplog gaps will be constructed across certain gaps in the levee footprint. It is assumed that the stoplogs will be stored nearby for quick placement during high water events.
Gatewell	Existing corrugated metal pipes running through the levee footprint will be combined in some places and have a gatewell constructed to properly manage these intrusions through the levee.

2.0 Basis of Estimate and Quantity

The basis of the estimate is the “Draft Integrated Environmental Assessment and Feasibility Report” document dated November 2024 and “LOMO_JEFF_CA13 Quantity Calculations Advanced” dated August 2024. This document contains quantities for each tentative measure. All costs associated with lands and damages come from NWK Real Estate. It is assumed all required soil for each measure will be hauled approximately fourteen miles from the Prison Farm. The project consists of partial removal of the existing Capital View Levee and constructing a new federal levee with and annual exceedance probability of 1%. Following Engineering Regulation (ER) 1110-2-1302, Engineering and Design Civil Works Cost Estimating, cost estimates were prepared at the following level:

- Class 3 – Technical information (including designs) is approaching a 10 to 60 percent quality of project definition. There is greater confidence in project planning and scope, construction elements, and quantity development. The estimates rely less on generic cost book items and place greater reliance on quotes, recent historical, and site-specific, crew-based details. Class 3 estimates reflect improved technical documents. The estimates must include a supporting discussion on technical information (scope, design, acquisition, and construction methods, etc.) and the uncertainties associated with each major cost item in the estimate. Special attention must be given to large construction elements and items that are sensitive to technical information change. Typical Contingency Range could be 20 percent to 50 percent or higher.

3.0 Estimated Design and Construction Schedule

The estimated schedule is shown in Table B-2.

Table B-2. Estimated Project Schedule

Phase	FY Qtr
Expected Design Start	FY27 Q2
Expected Design Midpoint	FY28 Q4
Real Estate Acquisition Midpoint	FY29 Q2
Expected Contract Start	FY30 Q2
Expected Contract Midpoint	FY33 Q2

The Federal Interest Plan construction schedule is presented in this Appendix in Table B-3. The estimated construction time is based on:

Typical Construction Crew: (1 shift) working 8 hours per day and 5 days per week.

Table B-3. Estimated Construction Duration

	Federal Interest Plan
Expected Contract Start	FY30 Q2
Expected Construction End	FY36 Q2
Expected Contract Midpoint	FY33 Q2

- Construction Windows: None
- Overtime: This estimate contains no overtime to complete the project.

A detailed construction schedule has been created using the software ProjectLibre and a .pdf printout is attached. It is assumed that construction will last six years. Construction schedule risks have been identified and discussed in the Cost and Schedule Risk Analysis to obtain a contingency percentage.

4.0 Acquisition Plan

4.1 ESTIMATE

The estimate is based on one contract being awarded to the Prime Contractor with multiple sub-contractors. The acquisition strategy is assumed to be a Design Bid Build, full and open, Invitation for Bid contracting method. The prime contractor will be responsible for oversight of the contract overseeing the work performed by subcontractors.

4.2 SUB-CONTRACTING

For the Federal Interest Plan estimate, the subcontractors are broken out as:

- Structural Subcontractor
- Surveying Subcontractor
- Landscaping Subcontractor
- Hauling Subcontractor

It is assumed that the prime contractor will subcontract all hauling, stoplog, and closure structure work.

5.0 Project Construction

5.1 MOBILIZATION, DEMOBILIZATION AND PREPARATORY WORK

Mobilization/Demobilization: The estimate for this study assumes the Contractors will be from the Kansas City area. This does not exclude any work effort to contractors from other locations during the bidding process.

5.2 FEATURES AND DISCUSSION

- Site Access: The sites are easily accessible via local roads. Some minor access roads will be constructed to further facilitate construction.
- Construction Methodology: The construction methodology will be industry standard.
- Levee Setback: The new levee will be constructed to federal standards and will have an annual exceedance probability of 1%. The levee will contain various stability and underseepage berms, stoplog gaps, and gatewells.

6.0 Cost Estimate Assumptions

6.1 CONSTRUCTION COST ESTIMATE

The construction cost estimate was developed using MCACES 2nd Generation estimating software in accordance with ER 1110-2-1302, Civil Works Cost Engineering, 30 June 2016; UFC 3-740-05, Handbook: Construction Cost Estimating, 9 December 2022. The construction cost estimate was prepared using MII Version 4.4.4, and the latest 2023 English Cost Book, quotes on major material items, and 2022 Equipment Library (Region 05).

6.2 QUALITY CONTROL AND QUALITY ASSURANCE

The cost estimate has received an internal quality control (QC) review performed by a senior subject matter expert in cost engineering to ensure consistency in the approach. Internal QC controls have been tracked and filed. The technical review of the scope of the cost estimate, including assumptions and quantities, has been performed by the design team. The Civil Works Cost Engineering Section Chief and Branch Chief of Kansas City District has performed quality assurance.

6.3 LABOR RATES

The labor rates are based on current Davis-Bacon Act Wage Determinations for Jackson County, MO, MO20250001 04/19/2025. The labor rates have been adjusted to represent current pricing.

6.4 LABOR AND EQUIPMENT PRODUCTIVITY

No overtime hours or productivity adjustments have been included in the MCACES estimate.

6.5 EQUIPMENT RATES

This estimate is based on the latest available/supported MCACES MII equipment rate database (EP24R05), which has been updated for the estimate to represent current prices more accurately.

6.6 MATERIAL RATES

Material costs were derived from CB24EN – MII English Cost Book 2024. The price level date for this Cost Book is January 2024. An adjustment factor was included in the MCACES; this percent was derived from Engineering New Record. Quotes were received for major material cost items and were overridden within the MCACES estimate where possible and a tariff adjustment factor of 10% added on non-quoted items.

6.7 ESCALATION

Escalation rates used are from CWCCIS tables published 28 October 2025 and has been applied to the estimate within the TPCS. Once labor, equipment, and material prices were normalized, escalation factors were included to arrive at a price level date of October 2024 and a fully funded cost at the midpoint of construction (July 2033) indicated in Table B-2.

6.8 FUNCTIONAL COSTS

Functional costs using the Civil Works Breakdown Structure (CWBS) associated with this work were developed from quantity take-offs using hand sketches and excel spreadsheets, historical costs and input from PDT members as follows:

01 – Lands and Damages: This account covers Real Estate costs for Construction.

02 – Relocations: This account covers costs to relocate utilities.

06 – Fish and Wildlife Facilities: This account covers mitigation services, such as tree plantings and native grass plantings.

11 – Levees and Floodwalls: This account covers the bulk of the project, including all work associated with constructing the levee and berms.

30 – Planning, Engineering and Design (PED): This account covers all costs associated with Planning, Engineering, and Design. The costs are based on 12 percent of the construction cost. This includes Project Management, Planning & Environmental Compliance, Engineering & Design,

Engineering Tech Reviews, Life Cycle Updates, Contracting and Reprographics, EDC, Planning during construction, Adaptive Management and Monitoring, and Project Operations.

31 Construction Management (CM): This account covers supervision and administration costs during construction. The costs are based on 13 percent of the construction cost, including Construction Management (including QC), Project Operations, and Project Management.

6.9 ESTIMATE ASSUMPTIONS

Key assumptions used for estimating the construction cost of the proposed alternative are as follows:

- 1) All required soil will be excavated from the Prison Farm Levee system and hauled to the construction site. An approximate thirteen-mile haul distance is assumed to be hauled to the jobsite. Any changes to this assumption will have an impact to the project cost.

6.10 CONTINGENCIES

Current Headquarters USACE guidance requires a formal risk analysis on all projects over 40 million dollars. In accordance with ER 1110-2-1302 and ECB 2007-17, 30 June 2016, Cost Risk Analysis was used to identify and measure the cost impact of project uncertainties within the estimated total project cost.

Oracle Crystal Ball analysis was used to develop contingencies for the CA13 Plan (Hybrid Alignment, Profile at 1% AEP). Contingencies are added to the cost estimate based on results of risk analysis. A Cost and Schedule Risk Analysis workshop was held on 25 November 2025 to develop this contingency.

Risks that could affect the project costs and design assumptions prior to the detailed PED phase include:

- Variation in estimated quantities
- Changes in Acquisition strategy
- Changes in bid schedule
- Changes in material availability and sourcing
- Unexpected contaminated soils
- Unexpected geotechnical issues
- Unanticipated underground utilities
- Delays in funding
- Unseasonal weather delays (tornados, flooding) during or prior to construction
- Delays in coordinating with the railroad and other entities

The contingency determined by the Cost and Schedule Risk Analysis is in the amount of \$72,300,000 at the 80% confidence level and fully funded project level. Contingency is spread across all construction accounts evenly. The resulting contingency percentage is 41%. The 01, 30, and 31 accounts have a separate contingency percentage derived by the PDT.

6.11 TOTAL PROJECT COST SUMMARY

The Total Project Cost Summary (TPCS) Sheet includes the construction costs from the MCACES estimate, project markups, as well as costs for Lands and Damages, Planning, Engineering & Design, and Construction Management.

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Lower Missouri Jefferson City L-142 Feasibility Study
PROJECT NO: P2 496630
LOCATION: Jefferson City, MO

DISTRICT: NWK District
POC: CHIEF, COST ENGINEERING, J. Dillon
PREPARED: 5/20/2026

This Estimate reflects the scope and schedule in report; 1_Draft_Main_Feasibility_Study_Report 11/26/2024

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	Program Year (Budget EC): 2026 Effective Price Level Date: 1 OCT 25				Spent Thru: 1-Oct-25 (\$K)	TOTAL FIRST COST (\$K) K	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
						ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J						
02	RELOCATIONS	\$22,346	\$10,056	45.0%	\$32,402	0.0%	\$22,346	\$10,056	\$32,402	\$0	\$32,402	27.0%	\$28,376	\$12,769	\$41,145
06	FISH & WILDLIFE FACILITIES	\$758	\$341	45.0%	\$1,099	0.0%	\$758	\$341	\$1,099	\$0	\$1,099	27.0%	\$963	\$433	\$1,396
11	LEVEES & FLOODWALLS	\$123,090	\$55,391	45.0%	\$178,481	0.0%	\$123,090	\$55,391	\$178,481	\$0	\$178,481	27.0%	\$156,301	\$70,335	\$226,636
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$146,195	\$65,788		\$211,983	0.0%	\$146,195	\$65,788	\$211,983	\$0	\$211,983	27.0%	\$185,639	\$83,537	\$269,176
01	LANDS AND DAMAGES	\$38,670	\$1,186	3.1%	\$39,856	0.0%	\$38,670	\$1,186	\$39,856	\$0	\$39,856	11.1%	\$42,957	\$1,318	\$44,274
30	PLANNING, ENGINEERING & DESIGN	\$21,774	\$5,920	27.2%	\$27,694	0.0%	\$21,774	\$5,920	\$27,694	\$0	\$27,694	13.3%	\$24,663	\$6,716	\$31,380
31	CONSTRUCTION MANAGEMENT	\$8,772	\$2,632	30.0%	\$11,403	0.0%	\$8,772	\$2,632	\$11,403	\$0	\$11,403	29.7%	\$11,378	\$3,413	\$14,791
PROJECT COST TOTALS:		\$215,411	\$75,525	35.1%	\$290,936		\$215,411	\$75,525	\$290,936	\$0	\$290,936	23.6%	\$264,637	\$94,985	\$359,622

PROJECT MANAGER, Ginger Niemann-Harper

CHIEF, PLANNING, T. Gemeinhardt

CHIEF, PROJECT MANAGEMENT, M. Corkill

CHIEF, DPM, E. Shumate

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ESTIMATED TOTAL PROJECT COST: \$359,622