TAB VII – Baseline Cost Estimate

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1 Project Scope

The Village of Pomeroy (Village) is located along the right descending bank of the Ohio River in Meigs County, Ohio. Ohio State Route (SR) 833, also referred to as East Main Street, provides the main transportation route through the Village which is located adjacent to a reach of the streambank in need of immediate protection due to flood stage erosion and recessional bank and retaining wall failures. Approximately 8,000 linear feet (LF) of streambank is located within the project area, of which approximately 3,300 LF requires immediate protection. Since 2013, the streambank erosion and retaining wall collapse have resulted in the displacement of the northbound lane of SR 833. The paved lanes and shoulders, together with curb, drop inlets, cross drains, and utilities are misaligned as a result of these recent erosion and failure conditions. Without treatment, the streambank would continue to undergo flood related erosion and failure, leading to the undercutting and collapse of SR 833. Failure to protect this road would result in loss of access and endangerment to adjacent utilities and town infrastructure. As a result, the primary purpose of the study is to identify the sections of the streambank that are in immediate need of treatment and to develop a viable treatment solution for the protection of SR 833.

2 Cost Methodology

2.1 General

The feasibility cost estimate for the preferred plan has been prepared to an equivalent price level of 1 April 2018 using MCACES 2nd Generation MII Version 4.3. The preparation of the cost estimate is in accordance with guidelines and policies included in: “ER 1110-1-1300 - Cost Engineering Policy and General Requirements, (26 March 1993)” ; “ER 1110-2-1302 - Civil Works Cost Engineering, (15 Sept 2008)” ; “EI 01D010, Construction Cost Estimates (1 Sept 1997)” ; “EM 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region II, (July 2007)”; and “EM 1110-2-1304, Civil Works Construction Cost Index System (CWCCIS), (31 March 2012)” ; “ETL 1110-2-573, Construction Cost Estimating Guide for Civil Works, (30 Sept 2008).” The estimate was completed using the latest guidance from OCE concerning implementation of the Civil Works Breakdown Structure (CWBS) and Chart of Accounts. MII estimate software was used to apply unique crews to detailed work items and obtaining material and supply quotes from prospective vendors/contractors where possible for significant cost items.

2.2 Direct Costs

Direct costs are based on anticipated equipment, labor and materials necessary to construct this project. Direct costs have been calculated independent of the contractor assigned to perform the tasks. Following formulation of the direct cost, a determination is made as to whether the work would be performed by the prime contractor or a subcontractor.

2.2.1 Quantities

The estimate is based on detailed quantity take-offs prepared from the drawings and augmented by spot checks performed by re-taking-off the original drawings.
2.2.2 IDIQ Rates for Labor and Equipment
The estimate assumes project will be implemented as a task order with one of Huntington District’s current IDIQ contracts. These IDIQ labor and equipment rates are pre-negotiated to include all appropriate contractor markups (PTI, WCI, overhead, and profit).

2.2.3 Vendor Quotes
Vendor quotes have been acquired and documented for the key material prices associated with significant features of work. The key material item in this estimate is stone riprap.

2.2.4 Crews
Project specific crews have been developed for use in estimating the direct costs for items not estimated using job quotes or historical cost information. Crew members consist of selected components of labor classifications and equipment pieces assembled to perform specific tasks. Productivity has been assigned to each crew reflective of the expected output per unit of measure for the specific activities listed in the cost estimate. Foremen have also been considered in the crews.

2.2.1 Work Schedules/Overtime
The estimate assumes a 5 day/week 8 hr/day work schedule to optimize production of mobilized equipment.

2.2.2 Productivity
A crew show-up time and general productivity loss factor has been applied in the MII estimate on labor hours assuming a loss of 60 minutes per 10 hour shift (9 HRS / 10 HRS = 90% productive).

2.2.3 Sales Tax
Sales tax for the State of Ohio, Meigs County is 7.25% and is applied to bare material costs in the MII estimate.

2.3 Indirect Costs

2.3.1 IDIQ Prime Contractor
The construction contract is planned to be let as a task order with one of Huntington District’s current IDIQ contractors. IDIQ labor and equipment rates are fully burdened with all appropriate indirect markups. Markups of 11.00% for overhead, 9.01% for profit (from profit weighted guidelines), and escalation (from CWCCIS) are applied to remaining material and sub-quotes.

2.3.1 Business and Occupation Tax
Business and occupation tax for the contract work within the State of Ohio is $800 for $1 million in gross receipts plus 0.26% of gross receipts in excess of $1 million. This tax has been calculated as an average percentage based on the estimated contract cost and applied as a contractor markup in the MII estimate.
2.3.2 Bond
Bond is added as a contractor markup using the bond table.

2.3.3 Subcontractors – No subcontractors assumed for this project.

2.4 Project Feature Accounts

The baseline cost estimate was prepared and organized according to the Civil Works Breakdown Structure (CWBS). As such, the estimate includes the following feature accounts:

2.4.1 (16) Bank Stabilization
This feature account includes the cost for the construction contract. Key items of work include: environmental protection, light clearing and grubbing of brush and small trees along the river bank, marine-based placement of stone riprap at the river bank. Other items of work include extending drainage culverts with head walls, final site grading/fill, and seeding.

2.4.1 (18) Cultural Resource Mitigation
This feature account includes the mitigation cost for the removal of existing sandstone wall along the river bank that are of cultural historical importance. Mitigation measures include the design and installation of interpretative signage along the wall.

2.4.2 (30) Planning, Engineering, and Design
The work covered under this account includes project management, project planning, preliminary design, final design, preparation of plans, preparation of specifications, and engineering during construction, advertisement, opening of bids, and contract award. The cost for this account is estimated as 24% of the construction contract value.

2.4.3 (31) Supervision and Administration
The work covered under this account includes contract supervision, contract administration, construction administration, technical management activities, and District office supervision and administration costs. The cost for this account is estimated as 7.5% of the construction contract value.

2.5 Risk-Based Contingency Development

An Abbreviated Cost and Schedule Risk Analysis (CSRA) was performed on this project to identify the 80% confidence level project cost and schedule duration. The results of the analysis for construction are 7.1% and 7.1% for E&D and S&A, respectively.

2.6 ESTIMATED COST

The Total Project First Cost at PL 1 Oct 2017 is $1,921,000. For more information see the Total Project Cost Summary Sheet (TPCS).
2.7 FULLY FUNDED COST ESTIMATE

The fully funded cost estimate including inflation to the mid-point of construction is $1,924,000. The fully funded table distributes the base level cost estimate across the appropriate years according to the schedule. Each feature account is inflated to the mid-point of expenditure activity using CWCCIS factors. These inflated feature account totals are summed to yield a total fully funded project cost. For more information see the Total Project Cost Summary Sheet (TPCS).

3 PROJECT IMPLEMENTATION SCHEDULE

The total project schedule was developed from the current project implementation schedule developed by the PDT and managed by the Project Manager and expanding the construction schedule based on the significant construction activities and durations from the MII cost estimate. The construction schedule calendars include major holidays and non-work weather days.
<table>
<thead>
<tr>
<th>Activity ID</th>
<th>Activity Name</th>
<th>Original Duration</th>
<th>Remaining Duration</th>
<th>Physical % Complete</th>
<th>Start</th>
<th>Finish</th>
<th>BL Start</th>
<th>BL Finish</th>
<th>Variance - Start Date</th>
<th>Variance - Finish Date</th>
<th>Total Float</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFAS/SG/HGM</td>
<td>District: Engineers, Architects - Pomeroy, OH</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>12-Mar-17</td>
<td>10-Apr-17</td>
<td>-20.00</td>
<td>-20.00</td>
<td>-20.00</td>
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<td></td>
</tr>
<tr>
<td>A446 KO 100207 90003: Construction - Project</td>
<td>615.00</td>
<td>615.00</td>
<td>15-May-17</td>
<td>7-Jan-18</td>
<td>18-Apr-17</td>
<td>-20.00</td>
<td>-20.00</td>
<td>-20.00</td>
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</tr>
<tr>
<td>A2360</td>
<td>Construction - Project Closeout</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>12-May-17</td>
<td>14-Apr-17</td>
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<td>A2370</td>
<td>Construction - Project Closeout</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>12-May-17</td>
<td>14-Apr-17</td>
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<td>A2380</td>
<td>Construction - Project Closeout</td>
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<td>0.00</td>
<td>12-May-17</td>
<td>14-Apr-17</td>
<td>-20.00</td>
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<tr>
<td>A2390</td>
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<td>12-May-17</td>
<td>14-Apr-17</td>
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<td>A2400</td>
<td>Construction - Project Closeout</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>12-May-17</td>
<td>14-Apr-17</td>
<td>-20.00</td>
<td>-20.00</td>
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</tr>
</tbody>
</table>

Tab VII: Baseline Cost Estimate

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4 RISK ANALYSIS DEVELOPMENT

4.1 Cost and Schedule Risk Analysis Development

A Cost and Schedule Risk Analysis (CSRA) was performed on this project to more accurately identify risk and potential impacts to the project. This analysis required participation by entire PDT to identify the 80% confidence level project cost and contingencies.

4.2 Risk Results

The results of the cost and schedule risk analysis are shown below. Key risks contributing to the overall project contingency are presented below.

---

**Abbreviated Risk Analysis**

<table>
<thead>
<tr>
<th>Feature of Work</th>
<th>Contract Cost</th>
<th>% Contingency</th>
<th>$ Contingency</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Estate</td>
<td>$21,299</td>
<td>3.00%</td>
<td>$195</td>
<td>$22,494</td>
</tr>
<tr>
<td>General Conditions</td>
<td>$188,374</td>
<td>17.12%</td>
<td>$19,401</td>
<td>$207,775</td>
</tr>
<tr>
<td>Riprap</td>
<td>$906,062</td>
<td>20.37%</td>
<td>$277,653</td>
<td>$1,183,715</td>
</tr>
<tr>
<td>Reservoir, Cohords, Brease Control</td>
<td>$85,766</td>
<td>17.93%</td>
<td>$14,887</td>
<td>$100,653</td>
</tr>
<tr>
<td>Mitigation for Historic Site Wall</td>
<td>$20,104</td>
<td>5.37%</td>
<td>$2,172</td>
<td>$22,276</td>
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<tr>
<td>Remaining Construction Items</td>
<td>$9,000</td>
<td>0.00%</td>
<td>-</td>
<td>$9,000</td>
</tr>
<tr>
<td>Planning, Engineering, &amp; Design</td>
<td>$172,861</td>
<td>7.09%</td>
<td>$12,267</td>
<td>$185,128</td>
</tr>
<tr>
<td>Construction Management</td>
<td>$86,490</td>
<td>7.09%</td>
<td>$6,133</td>
<td>$92,623</td>
</tr>
<tr>
<td>$</td>
<td></td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Real Estate</td>
<td>$21,700</td>
<td>3.00%</td>
<td>$1,603</td>
<td>$23,303</td>
</tr>
<tr>
<td>Total Construction Estimate</td>
<td>$1,553,262</td>
<td>27.44%</td>
<td>$316,385</td>
<td>$1,869,647</td>
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<tr>
<td>Total Planning, Engineering &amp; Design</td>
<td>$172,861</td>
<td>7.09%</td>
<td>$12,267</td>
<td>$185,128</td>
</tr>
<tr>
<td>Total Construction Management</td>
<td>$86,490</td>
<td>7.09%</td>
<td>$6,133</td>
<td>$92,623</td>
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<tr>
<td>Total Risk Factor Impact (including Real Estate)</td>
<td>$1,424,527</td>
<td>23.0%</td>
<td>$319,871</td>
<td>$1,744,398</td>
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</tbody>
</table>

**Fiscal Dollar Risk Add:** Allows for additional risk to be added to the risk analysis. Must include justification. Does not add to Real Estate.