

Physical Plant Project Cost Estimates

Accurate construction cost estimating is one of the keys to a successful project. Since each project is unique there is no 'catalogue' that can be referred to obtain an accurate cost of a contemplated project. Rather, significant time and effort is required to achieve any degree of accuracy. Renovations are more difficult to estimate than new construction because existing elements need to be assessed for adequacy for the new function, changes are often required to building systems that are some distance from the renovated area and tie-ins to existing take more time. Other implications, such as new Code requirements/standards, market conditions/available contractors and a lack of economic scale, may also come into play. In summary, if you need an estimate that has some value in managing the risks relative to your project, we will need to put in enough effort to give it that value.

The Requisition 7 form offers two choices for initial estimates:

Level 1/Order of Magnitude

This option should only be used for rough budgeting for future planning, not immediate projects. As there is no cost for this option, we can only spend about 15 minutes on the task and cannot guarantee accuracy.

Level 2/Conceptual

Level 2 estimating is required to obtain costs for immediate project and planning purposes. The estimate charge is quite small; for example, a project with a \$10,000 construction value is only charged \$50 for the Level 2 estimate. While this charge only partially covers our cost, it does serve to provide more resources for the many requests that are received.

As noted these are the initial estimates for future planning (Level 1) and immediate planning/project start (Level 2). The remaining 3 levels of cost estimates, described in the table below, progress from the Level 2 estimate on the more complex projects. Small projects likely only require the Level 2 estimate with periodic cost checks prior to tendering in order to keep on track. Grant applications such as CFI should be supported with estimates approaching Level 3 with sufficient contingencies to cover the possible cost variance for unknowns. Levels 3 and 4 are used to obtain more accurate costing as the design and drawings are developed and finalized. Level 5 estimates are reserved for large projects that require cost confirmation prior to tendering.

The following levels of project cost estimation will give some guidance on expectation of accuracy as well as degree of effort required. These levels are based on industry standards but modified slightly to reflect the preponderance of renovation projects at the University. Further information can be found at: Association for the Advancement of Cost Engineering http://www.umanitoba.ca/campus/physical_plant/media/AACEInt-CostEstClassSystem.pdf and Whole Building Design Guide (http://www.wbdg.org/design/dd_costest.php).

Classification	Description	Accuracy
<p>Level 1 (Class E) Order of Magnitude</p>	<p>A Level 1 estimate is not really an estimate at all. It is a guess at an order of magnitude cost so as to begin budgetary and feasibility determinations. If there has been precedence of a very similar renovation with similar constraints it can be based on that historical information with adjustments made for different square footages, number of rooms/seats, etc.</p> <p>Project information required for a guesstimate usually might include a general functional description, location within a particular building, the size expressed as building area, numbers of people, seats, etc., and intended use and complexity.</p>	<p>There are so many variables that are unknown at this stage that no commitment can be made on the cost accuracy.</p>
<p>Level 2 (Class D) Conceptual</p>	<p>The purpose of the Level 2 estimate level is to provide a cost estimate with greater confidence for budgetary and feasibility determinations. It requires far greater effort to reach a better definition of the scope of work. The more design alternatives explored the greater the time and effort required. The goal is to have a concise concept and approach so that variables can be limited and appropriate gross unit costs ascribed to elements to derive an overall cost guideline.</p> <p>The Level 2 estimate is based on the previous level of information available at Level 1, in addition to more developed concept such as a detailed program, and schematic layout. Information is typically supplemented with descriptions of utility requirements, structural implications, construction type/size determinations, and any other information that may have an impact on the estimated construction cost. Estimates are based on bulk system requirements stated as an approximate square footage cost over the renovation/construction area with allowances for anomalies not covered.</p>	<p>Estimate accuracy should be in the range of +100/-50%.</p>

<p>Level 3 (Class C) Design Development</p>	<p>Estimates prepared at Level 3 are used to verify budget conformance as the scope and design are finalized and final materials are selected. Information required for this level typically includes not less than 25% complete drawings showing floor plans, elevations, sections, typical details, preliminary schedules (finishes, partitions, doors, and hardware etc.), engineering design criteria, system single line diagrams, equipment layouts, and outline specifications.</p> <p>The Level 3 estimate provides a greater amount of accuracy, made possible by better defined and detailed design documentation. Estimates at this phase may be used for value engineering applications before the completion of specifications and design drawings. Estimates would be based partially on bulk system costs combined with a quantity take-off and appropriate unit costs applied to select elements.</p>	<p>Estimate accuracy should be in the range of +30/-15%. Given the wider range of tender quotations that can be received on smaller projects, it may not be necessary to go beyond this level of costing for those projects.</p>
<p>Level 4 (Class B) Construction Documents</p>	<p>Level 4 estimates generally apply to larger projects and are used to confirm funding allocations, to again verify the construction cost as design is being completed, for assessment of potential value engineering opportunities before publication of the final project design documentation for bids, and to identify any possible "design creep" items, and their costs, caused by modifications during the completion of the construction documents. This final construction document cost estimate will be used to evaluate the subcontract pricing during the bid phase. Level 4 estimates are typically based on construction documents not less than 90% complete. Estimates would be primarily based on a quantity take-off and appropriate unit costs applied to most elements with some bulk system costs allowances.</p>	<p>Estimate accuracy should be in the range of +20/-10%.</p>

<p>Level 5 (Class A) Bid Phase</p>	<p>The purpose of this level estimate is to develop probable costs in the preparation and submittal of bids for contract with an Owner. In the traditional "design-bid-build" delivery system, this would be with 100% completed and coordinated documents. A quantity take-off would be performed and appropriate unit costs applied to each element. The Level 5 estimate will be used to evaluate subcontractor bids and change orders during the construction process.</p> <p>It should be stressed that when preparing a bid at a prior estimate level, it is very important to include a complete and thorough "Scope of Estimate" statement that would state clearly such items assumptions, allowances, documents used for the estimate, and contingency amounts included.</p>	<p>Estimate accuracy should be in the range of +15/-5%.</p>
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