

# KCLS Capital Bond Projects: Design-Build Assessment

In August 2005, the King County Library System Board of Trustees approved the design-build construction process, as the first phase of Capital Bond Projects was progressing. Following Board approval, five new libraries in small communities were planned to be built using this process. Now that the majority of the design-build libraries are completed and construction has started on the final project, the construction project delivery method has been evaluated. The design-build method is recommended for future use when it is possible to bundle smaller projects together and for new libraries on sites that have established infrastructure and improvement criteria.

## Background

The design-build method allows one contractor to take responsibility for both design and construction, as compared to the traditional design-bid-build method where different entities complete the design and construction work. Thirteen public meetings were held from 2005 to 2007 in the communities where the five new libraries were to be built: Black Diamond, Snoqualmie, Carnation, Fall City and the Muckleshoot Indian Reservation. In March 2006, KCLS awarded BNBuilders a contract to design and build the five new libraries, which were bundled together as one large project.

## Proven Benefits

The following chart shows the anticipated benefits and the results of using the design-build process:

Benefits	Results
Mitigating escalating construction costs by bundling all five projects together	By locking the construction costs on all five projects at the 2006 construction rates, inflation costs were not incurred for the duration of the construction cycle. During the 2.5-year timeframe, materials needed to construct nonresidential buildings rose approximately 15 percent, according to AGC of America.
An expedited construction schedule for all five projects, compared to the traditional design-bid-build process	All five libraries will be completed in 30 months, due to sequencing through the various design and construction phases. If each project was completed separately using the design-bid-build process, it would have taken an additional four months for each project to solicit and select a consultant team and to complete the general contractor bidding process. It also would have taken 2-6 months for the consultant team to review construction documents for each building and site.
Managing five projects under one contractor streamlines the design and construction process	With one contractor for all projects, the design and construction phases overlapped, resulting in an efficient and expedited project timeline. Utilizing one contractor for all projects also allowed easy implementation of similar design elements at all five libraries.
Accurate forecast and timeline for construction work to be completed at all five libraries	The order of the five projects was at the contractor's discretion and KCLS was assured of having all five libraries completed within a specified timeframe. KCLS also avoided any delay costs as the contractor managed the overall schedule.
Similar design elements at all five libraries saves time spent on planning and design work	Using similar building designs on all five libraries, which ranged from 5,000 to 6,000 square feet, conserved time spent preparing and reviewing design documents. Each new library also features distinctive design elements to retain the individuality of each community.

## **Limitations**

A few challenges surfaced once the design-build process was under way. Due to the expedited project schedule, there wasn't sufficient time in the RFP process to prepare site permit documents that fully identified the infrastructure or site work required by each city. This was complicated by the fact that the cities were unable to provide preliminary criteria without completed studies and plans. As a result, some unforeseen site conditions and major infrastructure improvements such as roads and drainage were required. While these improvements were mandatory regardless of the building method used, they resulted in change orders that increased project budgets. With the traditional design-bid-build construction method, the infrastructure costs are identified earlier in the process and are budgeted for at the onset. Another challenge of the design-build method was that as projects progressed, it was difficult for KCLS staff to make modifications. The design-build process is not as flexible as the traditional building method in terms of allowing stakeholder review and revisions.

## **Change Order Analysis**

Accurate up-front cost estimations for design-build projects are difficult to achieve, as budgets are based on preliminary design documents and modifications occur over the course of the project. The total change orders for all five projects are anticipated to be \$3.5 million, or 19.4% of the total project budget. Sixty-one percent of these change orders, representing 11.8% of the total project budget, relate to regulatory frontage improvements and unforeseen site conditions. These same costs would have been incurred with a traditional design-bid-build process, although in that scenario most of the costs would have been identified in the design phase and included in the base construction budget. All other change orders are 7.6% of the total project budget. If the design-build method is used again in the future, the contingency budget must be increased to account for unforeseen project modifications, or infrastructure and improvement criteria must somehow be identified earlier in the process.

## **Conclusion**

The majority of objectives identified at the project onset were achieved with the design-build process, most notably an expedited construction schedule, reduced exposure to inflation and avoidance of multiple design processes that resulted from bundling all five library projects together. One of the new libraries, the Snoqualmie Library, even received a 2008 Build Washington Award from the AGC, a trade association that represents and provides services to the commercial construction industry. The project was selected as a winner due to several factors: collaborative effort, a fast-track schedule and the use of Building Information software, which creates a digital representation of all stages of the building process and helps projects stay on schedule. The design-build method remains a viable alternative in the future under the appropriate circumstances— ideally on projects where sites have established infrastructure and improvement criteria. It also is necessary to identify more specific building requirements at the project onset to better stabilize the total budget and to consider an increased contingency budget.