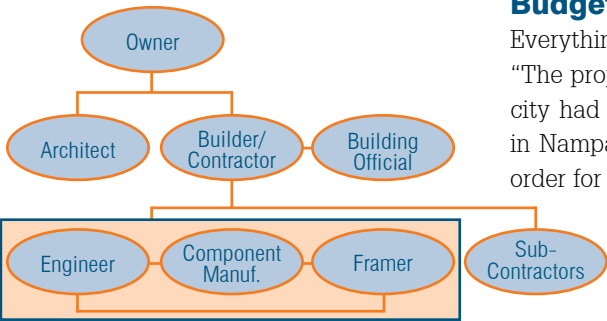


Communicating Success:

A Case Study about Communication on a Design-Build Project

by Kirk Grundahl, PE. & Emily Patterson



This flow chart shows some of the players involved in the Star City Hall project. There was a contractual relationship between Performance Engineers (Engineer) and Benchmark Construction (Contractor) and between SteadFast Framing (Framer) and the Contractor. Idaho Truss (Component Manufacturer) had a supply relationship with the Framer and did not transact directly with the Contractor.

at a glance

Initially planned to be a design-bid-build project, the bid for a new city hall building for Star, ID, came in at \$800,000 over budget.

Performance Engineers, who provided value engineering services, helped to bring the project back within its \$1.4 million budget.

Synergy between the engineering firm, the component manufacturer and framing company further reduced costs by streamlining communication.

The project for a new city hall in Star, ID, posed design, cost and scheduling challenges, as most projects do. What’s unique is how the construction professionals used teamwork and effective communication to tackle these issues and find solutions. Working together, the main players on the project turned what once was a budget crisis into a finished structure that was completed on time, within budget, and that met the client’s needs.

The project began in early 2007 with the client, the City of Star needing a new city hall. Located behind the old city hall, the site for the new Star City Hall posed no major zoning issues. Working with a budget of \$1.4 million, the city hired a civil engineer and also contracted with JJDS Architects, PLLC in Boise. The project began as a design-bid-build project, and JJDS Architects went through the zoning process and started work on renderings. The concept called for a two-story, 9,200 sq. ft. wood framed building in a grand lodge style. The design included an elevator shaft and a combination lower and upper roof structure with parapet walls.

Budget Challenges

Everything proceeded as planned until the bid came in nearly \$800,000 over budget. “The project was very well defined; it was just [almost] twice as much as what the city had in the bank,” said Clayn Sonderegger, owner of Benchmark Construction in Nampa, ID, contractor on the project. The budget would have to come down in order for the project to move forward. JJDS Architects and Benchmark Construction worked on reducing costs and lowered the bid by \$400,000. These costs savings primarily involved changing the outside of the structure by removing iron hardware, finishes and other aesthetic features.

When the city said that costs still had to be reduced, it decided to contract with Benchmark Construction and change it to a contractor-led design-build project. To further reduce costs, Benchmark Construction asked structural engineering firm Performance Engineers of Boise if the roof and overall structure could be altered to save money. Sonderegger admits there were some risks in reevaluating the design at this stage in the project. It was very possible that further changes could result in a cost increase. “We took the gamble,” Sonderegger said.

Value Engineering

Maintaining the original footprint for the building based on the architect’s drawings, Performance Engineers provided value engineering to adjust costs. Changes included removing two columns and reducing the number of hold downs from 28 to eight. The gamble on reevaluating the structure paid off. Instead of incurring additional costs, value engineering the location and specification of structural members actually saved approximately \$10,000 on the structural design (structure costs) and contributed toward the project’s overall cost savings. Reevaluating the structure prevented additional costs that the project couldn’t absorb and helped move the construction forward. For a summary of changes and cost savings on the project, see Table A.

These changes not only brought the project within budget, but they also aligned with the client’s needs, for example, adjusting costs while keeping a second conference room. “We were able to meet what they wanted by changing construction types and material usage,” said Shawn Reeder, engineer on the project for Performance Engineers.

Materials

Adjustments made to bring the project within budget involved a number of material changes. Keith Randall, Construction Manager for Benchmark Construction, said that reevaluating materials allowed costs to come down without compromising design or quality. “No corners were cut whatsoever,” he said. For example, the initial design called for a sandwich panel over the top of the roof trusses and shingles made from recycled tires, which could only be installed by one company in the area. Switching to a more conventional single membrane roof with asphalt shingles

achieved significant costs savings. Changes made inside the building included removing or using more conventional materials to replace recycled glass for counters, stainless steel tops for handrails and cloth clouds hanging in the board rooms. (See table B for some examples of material-related changes on the project and their cost savings).

Communication on the Project

When Performance Engineers began work on the project, the engineering firm worked with sister company Idaho Truss (now InteFrame Components, LLC) on truss and structural elements as well as cost analysis. Throughout the structural engineering and design phase, Performance Engineers worked closely with Idaho Truss and fellow sister company SteadFast Framing, exchanging information regarding loading conditions, flow of loads, framing issues and overall structural performance. “It is not uncommon for [Performance Engineers] to consult with Idaho Truss and SteadFast Framing to talk about the ease or difficulty of construction for design decisions,” said Kendall Hoyd, President of InteFrame, the parent company of Performance Engineers, Idaho Truss and SteadFast Framing.

When the design was complete, Idaho Truss worked with SteadFast Framing on a quote for turnkey framing for the project. Framing for the city hall was completed in 14 days, reducing the framing schedule by three weeks. Sonderegger said the quick turnaround even surprised some subcontractors on the project, who thought the framing might take up to six weeks. The framing deadline was especially important because

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Division	Changes	Cost Savings
General Requirements	Shorter schedule & less profit & overhead	\$30,000
Site Work	Removed playground equipment, exterior furnishings, fountain, sundial & removed some landscaping	\$85,000
Concrete	Removed colored concrete, concrete bench around fountain, pavers & size of foundation due to wall design	\$55,000
Masonry	Removed a double wall (block with a brick face), lessened the amount of brick to only a wainscot	\$67,000
Metals	Removed the stainless steel & powder coated the finishes, removed the exterior awnings at all of the windows but four, removed one set of stairs & some interior columns	\$82,000
Woods & Plastics	Removed some of the hold downs, removed the insulated panels on the sub sheeting on the roof, changed half of the roof system to trusses on the building & changed the finishes on the casework	\$81,000
Thermal & Moisture Protection	Removed the recycled rubber tire shingles	\$35,000
Doors and Windows	Removed some of the aluminum storefronts & custom color & changed all of the other windows to a colored vinyl	\$45,000
Finishes	Removed the carpet & stained the floors, removed the cloth clouds, antique pictures, hand painted murals, sealing all the trusses, glass counter tops & changed the bathroom hardware	\$103,000
Elevator	No changes	\$0
Mechanical	Removed the spiral ductwork, used roof top HVAC units, changed all the plumbing fixtures & plumbing rough-in material	\$110,000
Electrical	Removed an alarm system, changed the location of the service, removed & changed all of the light fixtures	\$85,000
TOTAL COST SAVINGS:		\$778,000

Table A summarizes changes made to the Star City Hall project to bring it within budget. The city determined the finishes and extras it wanted to keep or remove, while Benchmark Construction determined structural changes.

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the City of Star needed construction to be complete in time for a dedication ceremony at a community event that summer.

The synergy between engineering firm, component manufacturer and framing company offered many benefits on the project. “We offer a much more closely integrated and higher level of cooperation,” said Hoyd. Although the three sister companies worked together on this project, Performance Engineers is a separate, stand-alone corporation with its own books, profits and losses, and management structure. More often than not, Performance Engineers and Idaho Truss work on separate projects, while SteadFast Framing typically only works with Idaho Truss building components and framing materials.

Communication played an important role in the Star City Hall project, especially considering the need to lower costs and shorten the construction schedule. “When you shorten up a construction schedule, you’ve got to offer more communication for a successful project,” said Reeder. He added, “One of the things with projects like this is you roundtable with people in the field and people who work on paper. When those things are laid out and talked about openly, that’s when the magic starts to happen.”

While getting all of the parties talking is a step in the right direction, Reeder pointed out that effective communication is much more than just words. “We found that if you work directly with a contractor you have to make sure paperwork is followed correctly.

Construction Type	Original Concept	Final Concept	Estimated Cost Savings
Hold Downs	28	8	\$10,000
Columns	4	0 (eliminated steel stud columns and incorporated into wood stud walls)	\$4,000 - \$5,000
Framing Method	Conventional On Site Framing	Turnkey Framing with Structural Building Components	\$4,000 - \$5,000 & 3 weeks off of the framing schedule
Roof	Standing Seam Metal Roof with Recycled Rubber Shingles	Thermoplastic Olefin (TPO) Single Membrane Roof with Asphalt Shingles	\$35,000
Concrete	Pavers	Stamp Concrete	\$20,000
Finishes	Stainless Steel	Powder Coated Steel	\$40,000

Table B compares some portions of the original bid to the methods and materials used in the final concept along with the estimated cost savings for each.

Make sure direct communication is followed up with paperwork so the client gets a building that fills their needs,” he added.

Another benefit of this collaboration was how quickly the players could address and resolve issues. The normal process of communicating through the contractor, architect, engineer, subcontractors and then back through the chain to the contractor can often take a number of days. The model used for this project sped up that process, with issues often resolved within a day.

Conclusion

The high level of communication and collaboration between

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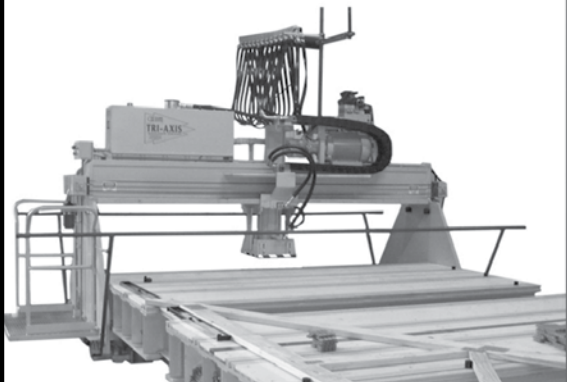
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construction professionals proved to be a winning combination. "That was a great project," Sonderegger said. "Everyone was happy." Making repeat trips back to the drawing board played a vital role in moving the project forward, and ultimately its success. Noting today's economic challenges, Sonderegger says that it was especially wise that the team worked to reduce costs, for the good of the project and the good of the client. "The city paid for it with what they had in the bank. They're looking like heroes now," he said. **SBC**



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