

Communicating Success

A Case Study on Communication on a Design-Build Project

By Kirk Grundahl, P.E. and Emily Patterson

The project for a new city hall in Star, Idaho, posed design, cost and scheduling challenges, as many projects do. What ultimately made this project a success, however, is how the construction professionals involved 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 and within budget, and that met the client's needs.

The project began in early 2007 with the City of Star, Idaho, needing a new city hall. Located behind the old city hall, the site for the new facility posed no major zoning issues. Working with a construction budget of \$1.4 million, the city hired a civil engineer and also contracted with an architect, JJDS Architects, PLLC. 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-square-foot, 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 project came in nearly \$800,000 over budget. To meet the shortfall, the city would have needed a bond to cover the additional cost, but after considering its options, the city council chose not to go this route. The project's costs would have to come down in order to move forward. The cost savings proposed initially by the architect and contractor, Benchmark Construction, reduced costs by approximately \$400,000 and primarily involved changing the outside of the structure by removing iron hardware, finishes and other architectural features.

When the city insisted that the costs still had to be reduced, the group went back to the drawing board again. The project switched to contractor-led design-build, with Benchmark Construction at the helm. To reduce costs further, Benchmark Construction asked structural engineering firm Performance Engineers to determine whether the roof and overall structure could be altered to save money. Performance Engineers served as the Structural Engineer of Record and was compensated for design changes. There were some risks in re-

evaluating the design at this stage of the project. It was very possible that further changes could result in a cost increase, and the City of Star's mayor told Benchmark Construction that the city could not afford additional costs.

Value Engineering

Maintaining the original footprint for the building based on the original drawings, Performance Engineers provided value engineering of the structural system. Changes

included removing two columns and reducing the number of hold-downs from 28 to 8. The gamble on reevaluating the structure paid off. Instead of incurring additional costs, the value engineering assessment actually saved approximately \$10,000, helping reduce the overall project cost so that construction could move forward. For a summary of changes and cost savings on the project, see *Table 1*. These adjustments not only brought the project within budget, but they also stayed in line with the client's needs. Savings due to changes in construction types and material usage allowed for the client to keep a second conference room in the design.

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Division	Changes	Cost Savings
General Requirements	Shorter schedule and less profit and overhead.	\$30,000
Site Work	Removed playground equipment, exterior furnishings, fountain, sundial and removed some landscaping.	\$85,000
Concrete	Removed colored concrete, concrete bench around fountain, pavers and 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 and powder coated the finishes, removed the exterior awnings at all of the windows but four, removed one set of stairs and some interior columns.	\$82,000
Woods and 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 and changed the finishes on the casework.	\$81,000
Thermal and Moisture Protection	Removed the recycled rubber tire shingles.	\$35,000
Doors and Windows	Removed some of the aluminum storefronts and custom color and changed all of the other windows to a colored vinyl.	\$45,000
Finishes	Removed the carpet and stained the floors, removed the cloth clouds, antique pictures, hand-painted murals, sealing all the trusses, glass counter tops and 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 and plumbing rough-in material.	\$110,000
Electrical	Removed an alarm system, changed the location of the service, removed and changed all of the light fixtures.	\$85,000
TOTAL COST SAVINGS		\$778,000.00

Table 1: Changes made to the Star City Hall project (by division) to reduce costs and bring the project within budget.

Materials

Adjustments made throughout the project to bring it within budget involved a number of material changes that allowed costs to decrease without compromising the design or quality. 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 in place of recycled glass for counters, stainless steel tops for handrails and cloth clouds hanging in the board rooms. (See *Table 2* for some examples of material-related changes on the project and their cost savings).

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 and 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 Finishes	Powder Coated Steel	\$40,000

Table 2: Comparisons of portions of the original bid for Star City Hall to the methods and materials used in the final concept along with the estimated cost savings for each.

Communication on the Project

When Performance Engineers began work on the project under Benchmark Construction, the engineering firm worked closely with component manufacturer, Idaho Truss, 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 framing company SteadFast Framing, exchanging information regarding loading conditions, flow of loads, framing issues and overall structural performance. 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, and the turnkey project reduced the framing schedule by three weeks. The framing deadline was especially important; the City of Star needed construction to be complete in time for a dedication ceremony at a community event that summer.

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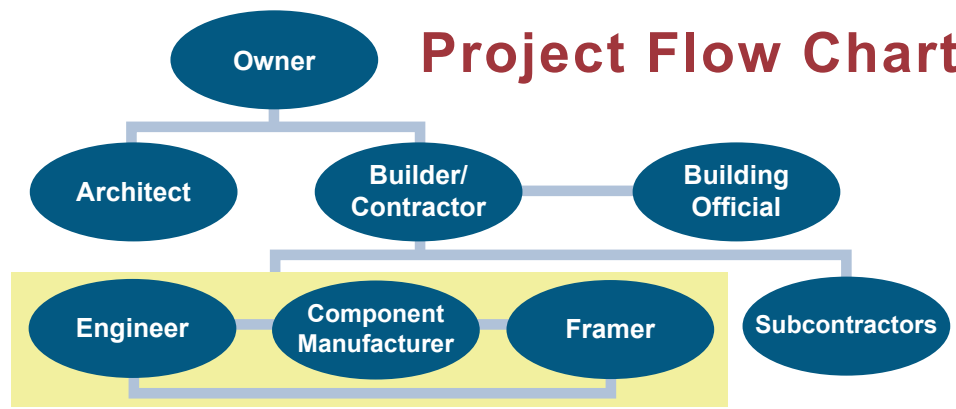


The close coordination between engineering firm, component manufacturer and framing company may have been non-traditional, but it offered many benefits on the project. The teamwork between Performance Engineers, Idaho Truss and SteadFast Framing enhanced coordination, helping to ensure comprehensive work from each company.

Communication played an important role in the Star City Hall project, especially considering the need to lower costs and shorten the construction schedule wherever possible. While getting all of the parties talking was a step in the right direction, effective communication is much more than just words; it also involves ensuring proper follow-through on all paperwork.

Another benefit of the high level of collaboration on the project 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 again can often take a number of days, or even weeks. The model used for this project accelerated that process, with issues often resolved within a day.

Project Flow Chart



This flow chart shows some of the players involved in the Star City Hall project. There was a contractual relationship between the Engineer and Contractor, and between the Framer and the Contractor. The Component Manufacturer had a supply relationship with the Framer and did not transact directly with the Contractor.

Conclusion

The high level of communication and collaboration between construction professionals on the Star City Hall project proved to be

a winning combination. Making repeat trips back to the drawing board played a vital role in moving the project forward and ultimately making it successful. ■

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