214 W. COOPER

engineering a presence

Theodore K Guy Associates exhibits the benefits of merging architecture and engineering in the conversion of a 1970s duplex

by Kelly Matlock

While many architecture firms hire engineers to provide input on structural design and systems for their design projects, Colorado-based Theodore K Guy Associates PC (TKGA) has the upper hand as it provides clients integrated architecture and structural engineering services in addition to the most current sustainable technologies. "Having structural engineering in-house has several advantages when compared to a traditional architecture-only practice," says Mike Bucchin, a partner at the firm, which specializes in residential developments and single-family homes for mountain towns.

ABOVE: Income restricted housing in Carbondale, CO, with solar-thermal collectors under construction.

To begin, whereas some architects may draft design plans and begin execution only to discover it won't work structurally, TKGA considers the structural design first and keeps the efficiency of systems in mind from the beginning. "Just having an engineering culture/presence with the office space requires our staff and design team to think through the structure of our designs as they are being conceived," Bucchin says. "Since structural design is integrated from the start, it allows us to work through the structural design and systems before we get too committed to a particular architectural direction, thus preventing us from wasting our fees or our client's construction dollars on an inefficient or costly system."

An adaptive reuse project that benefited from this expertise and foresight is 214 W. Cooper, in Aspen, Colorado. The project involved converting a 30-year-old vertical duplex into a single-family residence. "This project had significant land-use limitations, and tearing down the building completely would have meant the loss of a significant amount of floor area, since the zoning for the lot had changed since it was originally constructed," Bucchin says. "Since this was a 1970s duplex, there was not much appreciation for some of the modern amenities that our Aspen clientele expect...like high ceilings."

Since the firm was unable to make the house taller and allowed a limited amount of structural changes to the exterior, it decided to underpin the entire house with a new lower-foundation wall. The team removed all interior floor systems to make each story approximately 18 inches taller

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and converted a partially flat, trussed roof structure into a vaulted stick-framed roof—without ever removing the existing roof. "These modifications significantly increased the value of the property," Bucchin notes, "and maintained the existing floor area without making the building any larger or taller."

Though the firm's adaptive-reuse projects are inherently green for recycling existing buildings that would otherwise be destroyed, the firm also has designed and engineered several types of environmentally friendly projects for repeat clients like Aspen Skiing Company. Holiday House is the first multifamily LEED Platinum-certified building in Colorado; the affordable-housing project includes 30 modular, single-family residences and eight low-income apartments, which feature solar-thermal collectors to reduce monthly utility costs.

An additional perk of offering combined architectural and structural-engineering expertise is the ability to brainstorm and think through a variety of design options without needing to wait for consultation from outside engineers on whether a design plan will work structurally. "It creates an opportunity for us to be more creative in solving complex buildings, remodels, or details," Ted Guy, president, explains. "Since we are working side by side, we can very quickly think outside the box and study several potential solutions in very little time. This allows us more time to work through the aesthetic side of the problem, since solving the structural side is addressed first."

Because the firm doesn't need to revolve its schedule around consultants, it also reduces the time it takes to complete projects. "Often, in a traditional architecture-only practice, your deadline to complete a set of drawings is influenced by your consultants' availability and schedule," Bucchin says. "By reducing the consultants needed on a project by one, you can produce your drawing packages more quickly for your clients." An additional benefit of integration is the ability to find potential solutions for older buildings.

Guy mentions that the firm has used its integrated structural capacity to facilitate other adaptive-reuse projects in the historic core of Aspen as well: the Cantina Building received a new basement, the Brand Building achieved ADA compliance for ground-floor retail and a new basement, and an old grocery store turned nightclub was gutted and became a high-end retail outlet for Prada.

The firm also designed Bucchin's own residence in Glenwood Springs, Colorado, which features green elements like SIPs, reclaimed materials, solar orientation, solar-thermal panels, and a radiant hydronic heating system that runs on electricity.

Moving forward, the firm wants to continue integrating its engineering and design services to provide clients with more efficient designs, both structurally and aesthetically, and incorporate new sustainable technologies into adaptive-reuse work to salvage old buildings and, in turn, save resources and energy. "We feel that the industry will be moving toward smaller homes, more efficient homes with multifunctional spaces and places, and more thoughtful and intentional designs," Guy explains. "There will also be much more adaptive reuse as a result of the current economy and the increased awareness of the need for better stewardship of this increasingly crowded planet." **gb&d**