"An outstanding example of leveraging **LEED design elements** with architecture."
—Kent Long

Photos: James West

National Award—Less than $15 Million

BUCKNER COMPANIES HOME OFFICE, GRAHAM, N.C.

The new headquarters building for a nationwide crane leasing and steel erection company was a long-contemplated update to a venerable, family-run enterprise. Business was good and growing, but market conditions demanded better teamwork and communication. Existing space was cramped and poorly arranged. Most important to the third generation of family leadership, the company's existing offices said nothing of the firm's work, capability, or success.

The Buckner Companies turned its need into opportunity—a chance to project itself as a dynamic and resourceful contracting partner. The firm's new open, airy headquarters in central North Carolina is a showcase for the steel erector's trade. It also tells the story of steel, beginning with the material's salvage and reuse, to its integration with other building systems, and ending with its powerful impact when simply expressed and carefully detailed.

To make a place that would clearly express the company's line of work, Buckner turned to its own crane-rigging yard, which was piled with steel building parts rescued from various construction sites over several decades. Company president Doug Williams provided an inventory of materials from this "boneyard," challenging the design and construction team to incorporate all they could in the new building.

Engineers combed the list and assessed hundreds of steel sections and fabrications for condition, strength and suitability. They found wide-flange members for columns and composite floor and roof beams, cellular beams for floor girders, and open-web steel joists for lightweight spans. Corrugated metal decking found second life supporting the roof and floor, and two sections of 15-ft-tall plate girders became the walls of a new conference room, cantilevered out the front of the building to shelter the main entrance.

Buckner rescued a 15-ton, 58-ft-long pedestrian bridge from the college campus where the company had first installed it 30 years before. The bridge and its pylons became the connector between the new building and the existing offices. Even old crane parts and pieces of rigging found their way into the project, as stair hangers, column braces, and furniture pedestals.

In all, 83 tons of steel—more than 40% of all the steel in the building—came directly from Buckner's yard. This direct reuse eliminated the energy costs normally involved in refabricating salvaged steel, going, in effect, "beyond green" in making use of a material already widely appreciated for having high recycled content.

Virtually all of the structural steel in Buckner's headquarters is left exposed, yet steel is not the only or even the most distinctive structural element in the project. Overhead are pairs of 8-in. by 30-in. curved wood glue-laminated beams—also salvaged—that create the building's roofs and south-facing clerestory. Integrating the steel structure with these wood members was a special challenge for the designers and constructors. From the beginning, the architects, engineers, contractor, fabricator and erector collaborated closely to determine how the

connection between wood and steel would be expressed.

Custom-fabricated steel extensions, or "tails," at the ends of the wood beams served two purposes: to provide the additional length needed to span the building's central space, and to achieve the moment-resisting connections that allowed the wood and steel to work together.

In another carefully considered move, the wood beams pass through slots cut into the webs of an interior line of W14 columns, like thread through the eye of a needle. This interaction has the effect of showing off the ability of the steel to accommodate less malleable structural members.

Despite the challenges inherent in the assembly of the building's many exposed connections, the steel erector, who happened in this case to be project owner, credited the close collaboration on the team with producing a project that was "very erector friendly."

Because most of the building structure was to be left exposed to visually tell the story of the owner's business, detailing and construction quality was a significant focus of the project. The team considered following AESS criteria but rejected that approach, largely because of the desire to repurpose as much salvaged material as possible. Instead, the team placed rigorous emphasis on planning and detail to achieve high aesthetic results. Close coordination among the designers, contractor, fabricator and erector took into account the spacing of framing, types of connections, bolt patterns, and even the orientation of cotter pins.

The new building took form around the notion of surrounding a double height space with the offices of project managers and administrative staff, creating vertical, visual connection among all employees. The project added 15,000 sq. ft to Buckner's existing office building, which was extensively refurbished to make a cafe, exercise area and other high-profile common spaces. These shared places, and the second-level enclosed pedestrian bridge linking the new building with the old, are key to making all employees feel a connection to the new construction.

Fueled by the realized possibilities for reusing existing materials, the Buckner project grew to embrace an all-points sustainable building effort. Green building practices incorporated into the project include a chip-and-tar drive, stormwater bioretention pond, new materials with high recycled content such as galvalume roofing and linoleum floor covering, and water conservation measures including low-flow toilet fixtures and roof drains supplying a 15,000-gallon cistern for vehicle washing. The 15,000-sq.-ft project was completed in May 2010.

Owner
The Buckner Companies, Graham, N.C. (AISC Member)

Architect
Weinstein Friedlein Architects, Carrboro, N.C.

Engineer
Stewart Engineering, Raleigh, N.C.

Steel Detailer and Fabricator
CMC South Carolina Steel, Greenville, S.C. (AISC Member)

Steel Erector
Buckner Steel, Graham, N.C. (AISC and SEAA Member)

Contractor
Romeo Guest, Durham, N.C.