

EXECUTIVE SUMMARY

Boulder Aiken Audubon Research Outpost

Category: Small Projects

Unique & Innovative Project:

1st Commercial Project in the U.S. to Use CLT Panels
Fabricated & Sourced 100% from Colorado Wood

The Aiken Audubon Research Outpost stands as a groundbreaking example of sustainable design, hands-on education, and collaborative engineering. Located in a bird refuge that supports over 330 avian species, this 1,000 SF facility was conceived, designed and built by University of Colorado Denver architecture students in partnership with KL&A Engineers & Builders, as the structural engineering design consultant. Completed on time and within the modest \$175,000 budget, the project is the first commercial project in the U.S. that uses cross-laminated timber (CLT) panels fabricated and sourced 100% from Colorado wood (Engelmann Spruce).

Set Precedence for Future Mass Timber Construction

With no prior performance data for Colorado-sourced CLT, the firm conducted custom structural analysis and worked directly with the supplier to evaluate material strength properties. This pioneering effort informed the development of analytical models and detailing solutions tailored to the new product, setting a precedent for future mass timber construction in the region.

The students designed an open-vaulted ceiling without a ridge beam and expansive openings for light and views, which required innovative lateral resistance strategies. The students' insistence on architectural purity, such as avoiding a ridge beam for an open-vaulted ceiling, challenged KL&A to design solutions that are less typical for commercial buildings (like tie rod trusses) and push the envelope on lateral resistance strategies, including using the CLT panels as shear walls. In collaboration with the CU Denver students, KL&A helped develop a cordwood screen system made of beetle-kill lodgepole pine that reduces bird strikes on glazing while maintaining natural light and aesthetics.

Minimizes Environmental Impact While Supporting Regional Forestry Management

Sustainability and environmental stewardship were central to the project's success. By using CLT made from locally harvested timber—a material that sequesters carbon and reduces transportation emissions—the building minimizes environmental impact while supporting regional forestry management. The raft foundation preserved existing tree roots, and minimal grading maintained the site's natural character.

Positive Educational, Social & Environmental Outcomes

Beyond technical innovation, the project delivered lasting educational and social value. KL&A met weekly with the students during design and maintained daily communication during critical construction phases. This mentorship gave future architects firsthand experience in the structural implications of their designs, fostering a deeper understanding of interdisciplinary collaboration. The building itself will serve as an active research station for bird banding, education, and ecological outreach, demonstrating the role of engineering in advancing both environmental science and community engagement.

Award-Worthy Sustainable Building Practices & Future Educational Value of Engineers

This project is award-worthy for:

- Its integration of untested, locally sourced mass timber in a commercial structure;
- Its ability to balance architectural ambition with structural integrity; and
- Its positive environmental and educational impact.

Through ingenuity, partnership, and respect for the site's ecological sensitivity, KL&A helped transform a student vision into a research facility that advances sustainable building practices and redefines the collaborative role of engineers in shaping the future of the built environment.