

NAME OF PROJECT	AIKEN AUDUBON RESEARCH OUTPOST
TYPE OF PROJECT	Outdoor Classroom and Bunkhouse
PROJECT SIZE	600 sq. ft. (Outdoor Classroom) 400 sq. ft. (Bunkhouse) 1000 sq. ft. total
COST PER SQUARE FOOT	\$175
OVERALL CONSTRUCTION COST	\$175,000
PROGRAM SUMMARY	<p>The project brief called for a new open-air research station to support migratory bird monitoring and environmental education programming at Chico Basin Ranch, an 80,000-acre working ranch and habitat preserve in southeastern Colorado. Operated by the Bird Conservancy of the Rockies, the banding station functions for two five-week seasons each year, coinciding with spring and fall migrations. In addition to daily bird capture, data collection, and banding, the program includes environmental education for local school groups and opportunities for public engagement through guided birding and volunteer work.</p> <p>The previous infrastructure—consisting of a canvas canopy, a weathered shed, and makeshift work surfaces—no longer met the operational or educational needs of the program. In response, [name redacted] was engaged to design and construct a new facility that would provide shelter, equipment storage, and temporary accommodations, while remaining sensitive to ecological conditions on-site.</p> <p>The new station includes an open-air classroom, secure storage, and seasonal bunkrooms. All elements were constructed by graduate students using prefabricated cross-laminated timber (CLT) panels sourced from Colorado Engelmann spruce. The timber was harvested through sustainable forest management practices, including selective thinning and pest mitigation. Cordwood screens at the eastern and western elevations, assembled from the offcuts of CLT panel fabrication, serve as aesthetic and environmental components: they filter light, shield users from wind, and mitigate bird strikes by diffusing reflective glare at glass surfaces. The structure was designed to avoid tree removal, minimize ground disturbance, and operate entirely without mechanical conditioning.</p>
PROJECT COMPLETION DATE	May 2025
PROJECT LOCATION	Chico Basin Ranch, Colorado



AIKEN AUDUBON RESEARCH OUTPOST

REFRAMING THE PRAIRE RESEARCH OUTPOST

Situated in southeastern Colorado, Chico Basin Ranch spans 80,000 acres, straddling the boundaries of El Paso and Pueblo Counties near Hanover, Colorado. Owned and leased by the Colorado State Land Board, the ranch's prairies are interspersed with ponds, nestled within cottonwood and willow bosques, making it an ideal haven for birds migrating along the Front Range during their seasonal journeys. Operated by the Bird Conservancy of the Rockies, the ranch's Bird Banding Station is situated on the property for ten weeks each year, spanning the fall and spring seasons. During these five-week periods, the Bird Conservancy not only conducts bird banding operations but also hosts educational sessions for school groups. Additionally, it welcomes birders to engage in birding activities and contribute to the collection and banding process as volunteers.

Since its inception in 1999, the Bird Conservancy's existing operational setup, comprising a weathered shed, collapsible rain canopy, plastic table, and log-topped water drums serving as benches, exhibited signs of deterioration and no longer met the operational requirements of the banding teams. Recognizing this need, the Land Board collaborated with [name redacted], providing an opportunity for the development of a new design and structure. The Chico Basin Ranch Bird Banding Station was conceived as both an outdoor classroom and a specialized research platform dedicated to migratory bird observation. In addition to an open-air space conducive to learning and research, the facility is equipped with storage facilities for materials and equipment, as well as bunk rooms for overnight stays onsite.

The primary material and structural element of the project is cross-laminated timber (CLT), which is composed of Colorado Engelmann spruce. The timber for the CLT milling process was sourced directly from Colorado forests, utilizing timber cut for sustainable forest management practices. These practices encompass selective logging and thinning for wildfire mitigation, pest and disease management, and reforestation. Cordwood screen walls at the eastern and western ends of the building provide an experience for users that fills the space with dappled sunlight, reminiscent of that observed in the surrounding tree groves. Additionally, they protect against the elements, help prevent bird strikes by disrupting reflective glare at window openings, and maintain a connection to the surrounding outdoors. The cordwood used to fill the screen frames is a consequence of sustainable forest management practices, similar to those employed in the CLT. The gabled-roof form of the building draws inspiration from the architecture prevalent in the American West, with weathering steel cladding serving as a barrier between external and internal conditions.

FRAMEWORK FOR DESIGN EXCELLENCE

DESIGN FOR INTEGRATION

ENVIRONMENTAL, SOCIAL, AND ECONOMIC PERFORMANCE

Located in southeastern Colorado and built for the Colorado State Land Board, the Chico Basin Ranch Bird Banding Station was conceived as a dual-purpose facility, integrating an open-air classroom with a scientific field station for migratory bird monitoring. The design-build process engaged students in every phase of development—from schematic design to on-site fabrication—creating an immersive learning environment that bridged architectural education with hands-on construction and ecological stewardship.

The structure's material palette and formal language were carefully coordinated to respond to both programmatic needs and climatic conditions. Cross-laminated timber panels, composed of Colorado-grown Engelmann spruce harvested from wildfire mitigation efforts, were used to establish the building's primary frame and enclosure. These panels were prefabricated off-site and assembled with precision on location, enabling a low-impact construction timeline and tighter tolerances.

Cordwood screens—dry-stacked and biscuit-joined—offer both material reuse and atmospheric modulation. These screens create dappled shade, provide wind protection, and focus the user's view toward the tree groves. The gabled roof echoes vernacular ranch structures while housing solar-ready infrastructure, highlighting the project's alignment with both tradition and future-forward systems. Throughout, the integration of design, material performance, and educational purpose remains at the heart of the project.



DESIGN FOR RESOURCES

EMBODIED CARBON, CIRCULAR ECONOMY, AND DURABILITY

The project was developed with a resource-conscious mindset at every level—from the selection of structural materials to the reuse of waste wood in expressive, low-tech assemblies. Cross-laminated timber was selected for its high strength-to-weight ratio and carbon-sequestering properties. It allowed for quick and efficient erection on a remote site, reducing construction waste and environmental disturbance.

The timber used in the CLT panels was sourced from Colorado forests undergoing active management for fire and pest control, reinforcing a regenerative forestry loop. The cordwood elements were constructed from leftover cuts and off-spec logs, designed into modular screen walls that provide sun shading and wind protection. This dry-stacked, biscuit-joined method allowed for future disassembly or reuse, aligning with principles of design for deconstruction and adaptability.

Weathering steel siding was chosen for its durability and longevity in an exposed prairie environment, reducing maintenance and replacement cycles. Open-air spatial planning and passive ventilation eliminate the need for heating or cooling systems, significantly reducing operational energy use. Together, these strategies created a project that treats material not as a finite resource to consume, but as a story to continue—responsibly, respectfully, and with intent.



DESIGN FOR ECOSYSTEMS

BIODIVERSITY, HABITAT PRESERVATION, AND RELATIONSHIP TO SITE

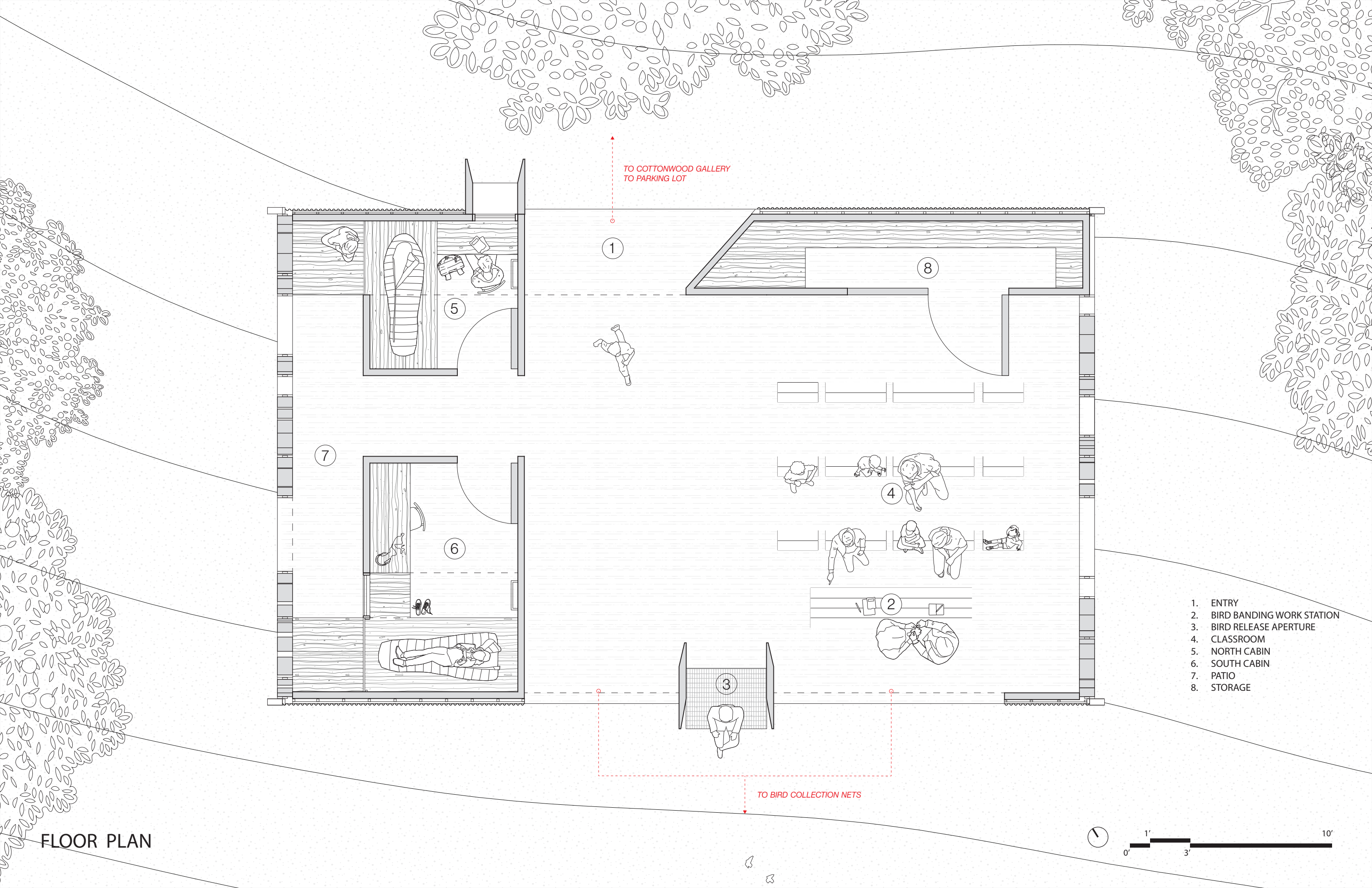
Situated on 80,000 acres of shortgrass prairie and riparian corridors, the Chico Basin Ranch project was developed in direct dialogue with its surrounding ecosystem. The site is a known migration corridor and nesting ground for dozens of bird species, and the structure was sited and oriented to minimize disruption to existing patterns of habitat and behavior.

The building footprint was kept deliberately small, and no trees were removed during construction. Instead, the structure was nestled just within the bosque edge, drawing filtered light and wind while keeping its presence quiet and visually unobtrusive. The use of sustainably harvested Colorado timber for both the CLT panels and cordwood walls reinforces a regional materials cycle, linking the project's built form to the health of surrounding forests.

Construction waste was minimized through digital prefabrication methods, and cordwood components—normally considered waste—were reclaimed as performative design features. These wood assemblies also allow for seasonal airflow while maintaining visual and acoustic privacy during educational programming. Rainwater is directed away from footpaths and into native planting zones, and the structure's shaded, open-air plan reduces the need for mechanical systems entirely. The project celebrates the ecosystem not only through passive environmental strategies but also by becoming a tool for its study and protection.







TO COTTONWOOD GALLERY
TO PARKING LOT

TO BIRD COLLECTION NETS

- 1. ENTRY
- 2. BIRD BANDING WORK STATION
- 3. BIRD RELEASE APERTURE
- 4. CLASSROOM
- 5. NORTH CABIN
- 6. SOUTH CABIN
- 7. PATIO
- 8. STORAGE

FLOOR PLAN

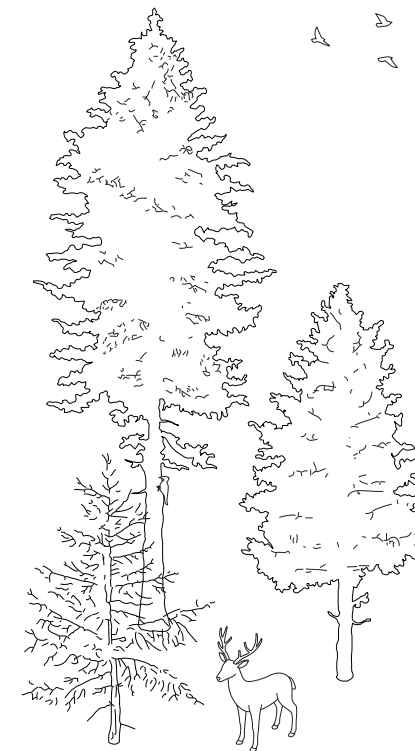






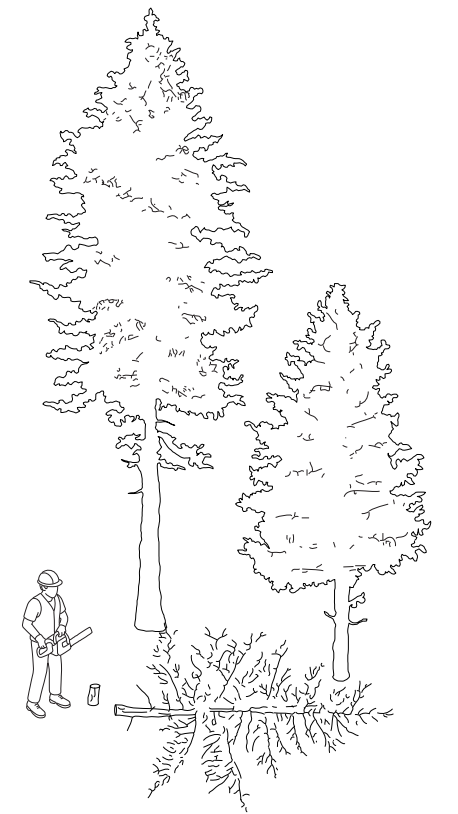






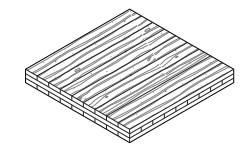
COLORADO FORESTS

Colorado's forests have become dense and overgrown, which weakens ecosystems and increases the risk of severe wildfires. Sustainable forestry practices like selective harvesting thin these forests carefully, promoting resilience and enhancing carbon sequestration in healthy, growing trees.

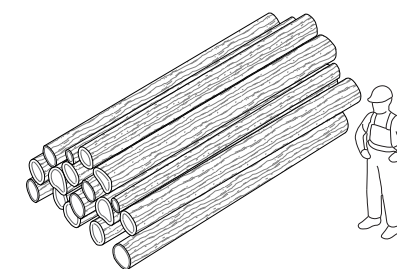


WILDFIRE MITIGATION

Removing small-diameter trees reduces fuel loads and fire intensity. While often too small for traditional lumber, these trunks are valuable in a proactive forest management system focused on long-term ecological balance.

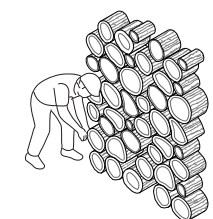


CLT



MANUFACTURING

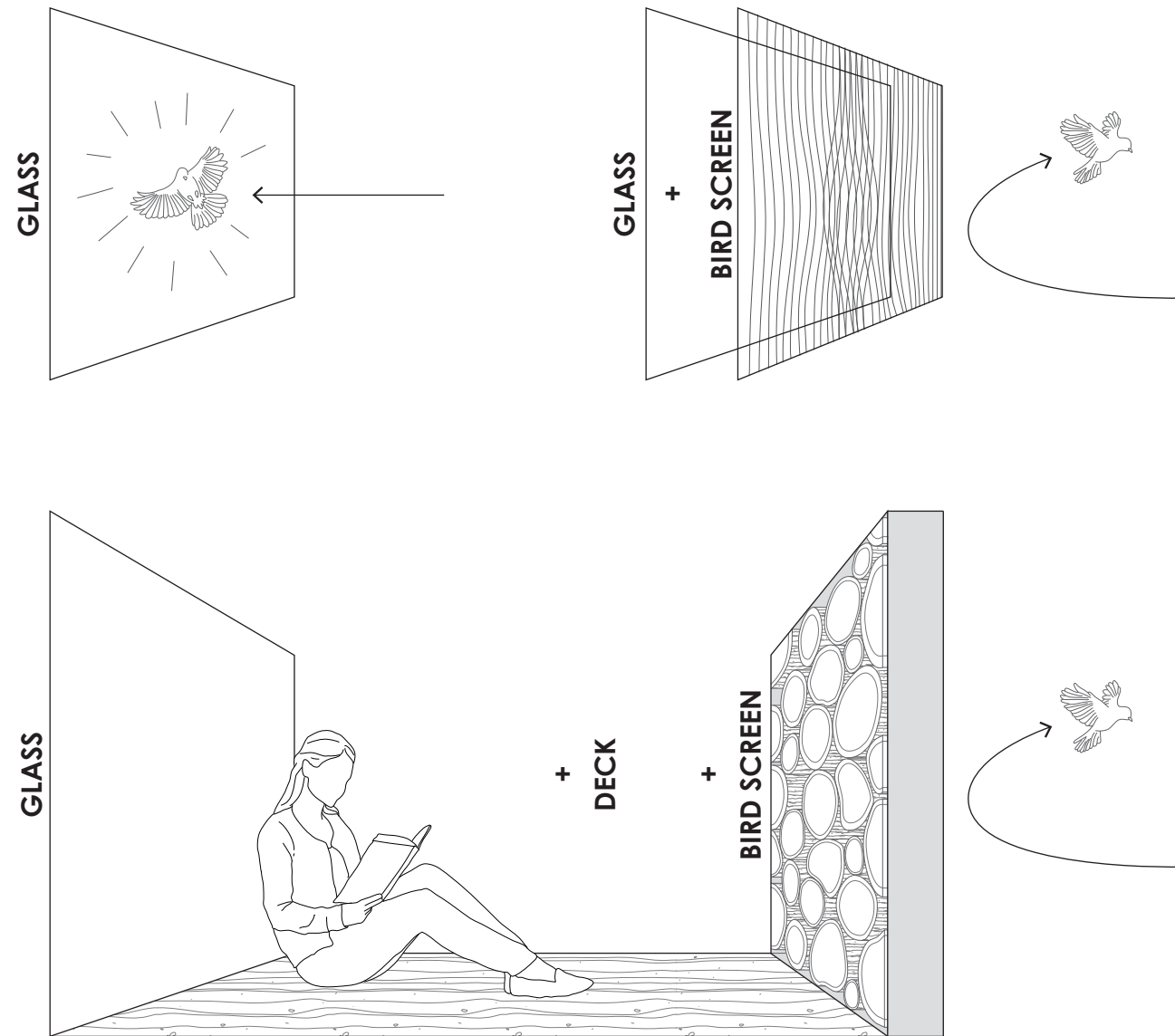
Low-value wood is sourced locally but must be processed out of state due to Colorado's limited timber industry. Through cross-lamination, these smaller logs are converted into CLT panels, minimizing waste.



CORDWOOD

CONSTRUCTION VALUE

With limited in-state timber manufacturing, Colorado relies on alternative methods to utilize this material. Cross-laminated timber (CLT) offers engineered structural components, while cordwood construction creatively repurposes off-cuts and irregular pieces. These approaches extend the lifecycle of low-yield wood, support carbon storage, and contribute to unique architectural character.



MITIGATING BIRD COLLISIONS THROUGH MATERIAL DESIGN

Extensive avian studies, including those conducted by ornithologist Daniel Klem Jr., estimate that between 100 million and one billion birds die annually in the United States due to collisions with glass. Birds interpret transparent and reflective surfaces as open sky or habitat, leading to fatal impacts. Given the ranch's location within a major migratory flyway, bird strike mitigation became a critical consideration in the design of the new field station. The team drew inspiration from Studio Gang's work on Aqua Tower in Chicago, which demonstrated how visual complexity on façades can significantly reduce the incidence of bird collisions.

To address this challenge, cordwood screen walls were introduced at the eastern and western elevations of the building. Constructed from offcuts of cross-laminated timber panels used elsewhere in the project, the screens were assembled by students using a dry-stacked, biscuit-joined method that required no adhesives or fasteners. Positioned in front of glazing, these porous walls diffuse sunlight and interrupt surface reflections, effectively reducing bird strike risk during peak migration periods. The layered assembly also serves as a windbreak, shades interior spaces, and frames outward views, offering both protection and connection to the landscape. As a byproduct of sustainable forest management and offcut reuse, the cordwood screen embodies a materially sensitive and ecologically responsive design approach, bridging habitat conservation with student-led fabrication.





DIAGRAM KEY

1. CORTEN CLADDING: 60% recycled content and 100% recyclable roof and wall cladding, protects the CLT and creates a barrier between internal and external conditions.
2. CROSS-LAMINATE TIMBER PANELS: Sustainably sourced from wildfire mitigation lumber that uses 100% Colorado Engleman Spruce. This rapidly deployable material reduced the construction timeline and sequesters half its weight in carbon.
3. HOT ROLLED STEEL APERTURES: Act as thresholds and highlight programmatic experiences within the building.
4. CORDWOOD SCREEN: Sourced from Colorado Lodge Pole Pine Beetle Kill Trees, typically seen as waste lumber. The screen reduces bird strikes on the glass, mitigates wind, and filters light to increase privacy in the cabins.
5. RAFT FOUNDATION: Monolithic shallow foundation to minimize damage to existing cottonwood root infrastructure.

