2011 ASLA Design Awards

Walking Mountains Science Center
Merit Award
Sherry Dorward Landscape Architecture, LLC.

Design under $500,000 Construction Budget
Project Name and Location: WALKING MOUNTAINS SCIENCE CENTER  Avon, Colorado  (Category 1B)

Project Summary:  Walking Mountains is an experiential natural science learning center founded in 1998. Its mission is "to awaken a sense of wonder and inspire environmental stewardship through natural science education." Each year, Walking Mountains reaches more than 3,000 school children in Eagle County with extracurricular field science programs, but it has never, until now, had a home base. With the donation of approximately five acres of land on Buck Creek in Avon, Colorado, Walking Mountains has finally been able to realize its dream: a physical facility that can support a greatly expanded science curriculum, diverse field study opportunities on site, and year-round community programs. After more than four years of work by the design team and over a year of construction, the new campus, with 16,500 square feet of built space and on track for LEED platinum, opened to the community in August 2011.

Construction Budget: See itemized costs on separate sheet, attached as required.

Purpose of the Project:  The design team's mission was to design a facility that supports the natural science–based educational mission of Walking Mountains and that, through simple but inspiring design, expresses the school’s deep commitment to environmental stewardship. A fundamental goal was to forge the strongest possible relationship between indoor and outdoor spaces, acknowledging that the site itself is the primary teaching medium, not the buildings. The project aims to be a model for sustainable technologies and a teaching tool to catalyze sustainable local industry practices. The design team’s charge was to achieve these goals through a seamless union of built environment and nature, with respectful development totally in context and in scale with the natural surroundings. The objective was not to embellish or replicate nature, but to enhance the experience and understanding of it.

Role of the Landscape Architect: A collaborative design team, consisting of the landscape architect and two architecture firms, was first engaged in early 2006 to:

- Assist the client and the architects in identifying the particulars of a functional and spatial development program to support the school’s long-range educational goals.
- Inventory site conditions and evaluate their implications for development.
- Explore alternative concepts for fitting the program to the site and assist the client in evaluating the options.
- Produce a master site and building plan for the proposed 5-acre campus that fully reflects both the organization’s commitment to environmental stewardship and its projected fund-raising capacity.
- Represent the client in numerous presentations to regulatory review bodies.

After final approvals by the Avon Planning Commission and Town Council of the center’s master plan and the larger PUD of which it was a part, in 2009 the team was authorized to proceed with design development and construction documentation. During this period, the landscape architect was responsible for:

- Refining concepts for the overall layout of the campus and the siting of buildings and outdoor facilities. This had to be done within the narrow confines of significant site constraints and the even narrower budgetary strictures of a small non-profit client.
- Assuring that the site plan maximizes opportunities for a diversity of outdoor educational experiences, outdoor field-study classrooms, community programs, and donor events.
- Developing workable strategies for achieving ASLA’s Sustainable Sites objectives and LEED SS and WE credits.
- Coordinating the services of the outside wetlands consultant who prepared the USACOE wetland permit application, and incorporating mitigation measures into the site and landscape plans.
- Coordinating work with the civil engineer to assure that site grading intent was achieved, wetland impacts were minimized, circulation requirements were met, and all facilities were ADA-accessible (despite a 10-foot grade change between the northern– and southernmost buildings).
- Coordinating design work with other disciplines, especially architects, lighting engineers and interpretive exhibit designers.
- Producing all construction and LEED documentation relating to site development and landscaping (not including roads and utilities or final grading and drainage plans, all done by the civil engineer).

The Site – Extraordinary Site Constraints:  Walking Mountains’ narrow valley-floor site measures almost five acres in size, but less than ¼ acre is actually developable. The remainder is constrained by jurisdictional wetlands, high groundwater, steep side slopes, required setbacks from Buck Creek, a pre-existing man-made pond, and a 100-foot easement for an overhead power line. Under these conditions, it was extremely challenging to fit the development program on the site. Additionally, the existing ranch road was inadequate for the proposed use, and a new access road built to town standards necessitated unavoidable disturbance to existing wetlands. Subsurface water flows far exceeded expectations and subsoils were extremely poor and mucky, greatly complicating excavations, trenching for utilities, and pile-driving for building foundations.
Project Requirements: In a series of intensive work sessions, Walking Mountains’ staff and the design team adopted these basic strategies and concepts:

- To fit the 16,000+ sq.ft. building program on the site’s limited developable land and, importantly, to give the school maximum flexibility to calibrate phasing to fund-raising, the architects and landscape architect opted for a campus-like arrangement of multiple smaller buildings reminiscent of early farmsteads in the area. As a result, no buildings encroached into wetlands. The campus concept gave the landscape architect more opportunities, by manipulating connections between buildings and creatively using grade transitions, to define a variety of sheltered outdoor spaces that could be accessed directly from interior spaces.
- The team was directed to aspire to a LEED platinum level of certification and to reduce the use of fossil fuels.
- Given the school’s educational mission, wetland impacts were to be mitigated on site rather than by paying into an off-site wetland bank; students will be involved in the monitoring of mitigation efforts.

Site/Landscape Design Concepts: Some of the key elements of the landscape architect’s plans are as follows:

- The access road was pushed to the outer edge of the site, thus enabling the campus core to be fully pedestrian and giving it a direct connection to the natural environment along Buck Creek.
- At the heart of the campus is a multi-purpose events meadow, the only part of the campus planted in turf (less than 1% of total site area) because it must support a much more intensive level of activity.
- Small outdoor classrooms are located within each of the ecosystems represented on the property (riparian, aquatic, wetland, montane forest).
- A network of accessible public trails with interpretive signage connects all facilities on the campus.
- Parking is located at the northern end of the site in the power line easement where structures are not allowed. A turnaround for emergency vehicles and school buses is provided at an intermediate point where the site is wide enough to accommodate it; overflow parking north of it is surfaced with pervious recycled asphalt.
- Total wetland area disturbed by the new access road amounted to only .07 acre; an equal area of new wetlands is being established on site. A boardwalk on helical piers makes the protected wetland areas accessible as an educational environment.
- The landscape plan contributes to stormwater management and water quality through the use of pervious pedestrian paving and the incorporation of natural swales, biofilters, green roofs, and vegetated settlement basins that filter run-off before it can enter wetland areas.
- Planting design emphasizes revegetation with drought-tolerant species native to the region, resulting in an anticipated reduction in water used for irrigation of almost 80% compared with a typical base case.
- A natural stone amphitheater in the campus core and much of the seating in outdoor classrooms utilize boulders excavated from a nearby construction site. Logs cleared on-site were also used for seating and chipped to provide resilient surfaces in play areas.

Significance of the Project – Accomplishments and Innovations:

- Successfully delivered a comprehensive outdoor teaching environment that is a model for outdoor education.
- Achieved strong connections between indoor and outdoor spaces through fruitful collaboration with architects.
- Collaborated closely with the civil engineer to develop an innovative approach to the design of the access road and the management of stormwater. The causeway-like road, slightly elevated above pre-existing grade and resting on a porous base retained by boulders, allows water to flow beneath it, reduces the extent of grading in the wetlands, and redirects water flows so that existing wetland vegetation continues to receive the water it depends on for survival.
- Will likely achieve LEED platinum with significant contribution from credits related to sustainable sites, and despite the fact that the site is relatively remote and rural, not urban. (All of the credits applied for in the LEED design-stage submittal were accepted by USGBC.)
- Raised the bar locally for achievement in sustainable site (and building) design. This will be one of the few platinum LEED projects in Colorado and one of the only green schools. The Governor’s Energy Office and the USGBC Green Schools Committee have already toured the project.
- Demonstrates to the public the breadth of the landscape architect’s role in project design.
- Shows how to create a memorable experience on an extremely limited site budget.

CONSTRUCTION COSTS – WALKING MOUNTAINS SCIENCE CENTER

The construction cost for the three first-phase buildings and all site improvements totals approximately six million dollars. (Only the staff housing remains to be built; it will happen in a later, as yet to be scheduled phase.)

The cost of site components for which the landscape architect was responsible is included in the $6 million:

$ 72,000 Woodwork: wooden benches for streamside classroom and boardwalk/aquatic classroom

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<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
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<tbody>
<tr>
<td>$18,000</td>
<td>Permeable pavers</td>
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<tr>
<td>$37,000</td>
<td>Purchase and setting of boulders for amphitheater, outdoor classrooms, and retaining wall at parking lot</td>
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<tr>
<td>$125,000</td>
<td>Landscaping: plants, hydroseeding of disturbed areas, topsoil, soil amendments, mulch, handrails, sand-set stone pavers, stone steps in the amphitheater, handrails, tots' nature play area, and irrigation</td>
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<tr>
<td>$24,000</td>
<td>Wetland impact mitigation and stream channel restoration</td>
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<tr>
<td>$276,000</td>
<td>This amounts to just under one-half of one percent of the total construction cost.</td>
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Also included in the total construction cost, but not part of the landscape architect’s scope, were site lighting; exterior signage (directional, interpretive, and donor-named spaces); drainage improvements for ground water management; roadway construction, asphalt paving and concrete curbing; and the school’s portion of common costs for the new access road and extension of utility lines to the site (shared with two other property owners in the valley).

The capital campaign goal for the new campus is approaching $10 million, covering hard and soft costs, the cost of fund-raising, and some of the anticipated increase in annual funds required to operate and maintain the campus in 2011-2012.