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location
South Burlington, VT

completion
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HERITAGE AVIATION HANGAR

In line with Vermont's strong environmental history, TruexCullins strips an Air National Guard hangar down to the steel and rebuilds a model of sustainability

Spanning five decades, the Burlington, Vermont architecture firm of TruexCullins has a history of sustainable design, beginning with the Church Street Marketplace in the 1970s on the eastern shores of Lake Champlain. Considered by Forbes *magazine in 2009 as one of the "prettiest" cities in America and by* Children's Health *magazine that same year as the "best place in the United States to raise a family," Burlington also lays claim to the beginnings of Ben & Jerry's Ice Cream in a renovated gas station in 1978.*

As an architecture and interior-design firm, TruexCullins provides expertise in five distinct design studios in the disciplines of education, workplace, home, resort, and interiors. Sustainable design is at the core of the practice. The firm makes a practice of demonstrating the benefits of green design with aesthetically pleasing, high-performance buildings and interiors that illustrate how sustainability enhances lives and the environment.

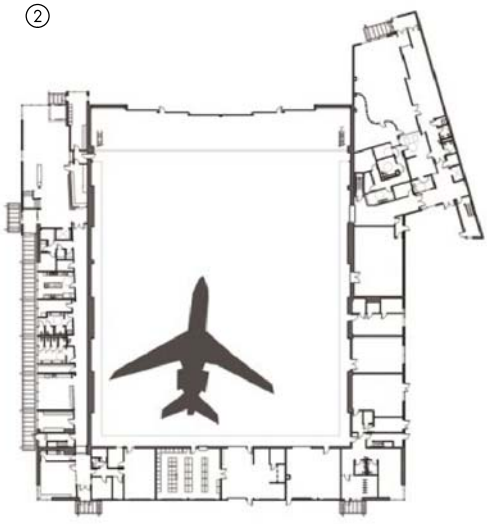
Collaboration is vital, and keeping things down to Earth is a hallmark of the firm's approach: "We have some great clients," reflects partner Richard Deane. "And we have a good group of people here to work with them. It's a collaborative effort to identify the vision of a project and then get from the beginning to the end. We like to have a little fun along the way and enjoy the process and each other." The convergence of the firm's collaborative approach, environmental experience, and desire for enjoyment is exemplified by a recent project: the Heritage Aviation Hangar project.

1/ The 35-foot-high hangar door flanks the airside entry to the passenger arrival/departure lounge. TruexCullins worked with the door manufacturer and fabricators to detail air sealing gaskets at the joints between the movable door panels and the door frame—the main source of air infiltration in hangar facilities. Photo: Jim Westphalen Photography.
2/ First-floor plan of TruexCullins' design. The existing building was stripped down to the underlying steel.
3/ On the eastern roof, with varieties of sedum in bloom, one can see the back of the photovoltaic array and the wind turbine. Rainwater is collected from both this roof and the higher hangar roof. Photo: Susan Teare Photography.
4/ Artificial light is seldom used during the day at the maintenance hangar. Multiple roof-mounted skylights and high windows to the south and east provide the illumination needed for most tasks. Photo: Susan Teare Photography.

client/
The Heritage Aviation campus at the Burlington International Airport was recently expanded to include a renovated aircraft hangar for maintenance operations and a Fixed Based Operation (FBO)—executive aircraft and charter airline facilities as well as aircraft and crew-support facilities. The building was to be stripped to the underlying steel and concrete shell and then outfitted with a new, high-performance exterior envelope, an entirely new HVAC system, electrical and safety systems, and a number of innovative environmental and renewable-energy strategies.

history/
In its previous life, the structure was a helicopter hangar for the Air National Guard. It was originally constructed sometime in the 1950s in South Burlington. "It's true in many projects that constraints make opportunities," Deane says of the existing elements the team found. "This was certainly the case on the Heritage Aviation Hangar." One such challenge was creating an efficient building skin.

skin/
Making efficiency a challenge, the 35-foot hangar door must be opened in extreme weather conditions. So the insulation rating for the new building skin was one of the original focuses. "We had to find a cost effective way to put a skin on the building that was reasonably efficient," Deane says. "We focused on standard-grade, industrial, metal panels." The interior and exterior metal skin has 3-inch rigid insulation and flexible rubber seals, creating a double interlocking joint when the panels are put together. For the interior, a layer of studs and drywall enabled the system to achieve better than an R20 insulation value.



5/ A main structural brace for the building becomes a primary design element within the interior of the arrival/departure lounge. Photo: Jim Westphalen Photography.
6/ Roof-mounted photovoltaic panels have full exposure to the southern sun. A solar-hot-water array also included in the plan provides domestic hot water for the facility. Photo: TruexCullins.

water/
The 72,000-square-foot building functions as both a high-end, commuter airline terminal and a maintenance operation for refueling and restocking the planes. The LEED Silver-certificated project included storm and wastewater-management systems and permeable pavement surfaces. A green roof collects and filters rainwater for plane washing and landscape irrigation.

energy/
A 10-panel solar-thermal system provides domestic hot water, a 120-panel photovoltaic array provides power, and a 100-kilowatt wind turbine generates electricity and heat. "We are...advocates for sustainable design and stewards of our clients' resources," Deane says. "We help them to understand how they can best invest in good design and sustainability."

culture/
Vermont's culture is a source of inspiration for the firm's many projects. "People move here for the clean water, clean air, and low crime," says Partner David Epstein. "There is a strong culture to keep Vermont green, and that belief has permeated local and state politics. ... We have been doing sustainable design here for a long time, and as a consequence, we have a lot of expertise in the building community."

In addition to work in Vermont, TruexCullins has an international portfolio that includes the LEED Silver project for the Anglo American School of Sofia in Bulgaria, where TruexCullins deployed an environmental audit using LEED for Schools criteria. The effort helped solve some major technical issues the school had with storm water and wastewater.

"We see institutions coming to us wanting to do sustainable design," Epstein says. "We have been shouting at the wind for some time now, and the wind is starting to change direction."
—by Scott Heskes