

R&D Magazine
2011 Lab of the Year
– High Honors

WBF

Teaching and Research Winery
and the **August A. Busch III Brewing**
and **Food Science Laboratory**

LEED® Platinum

Flad Architects



WBF

Teaching and Research Winery and the August A. Busch III Brewing and Food Science Laboratory

Benefitting from a large agricultural sector, renowned for its fine wine and diverse food production, the University of California has maintained active research and education programs in viticulture, enology, and food science for more than 125 years.

Now a new era begins for UC Davis with the addition of the Teaching and Research Winery and the August A. Busch III Brewing and Food Science Laboratory (WBF). Preparing future leaders for these industries, the

WBF combines a rich agricultural heritage with rigorous scientific inquiry. This state-of-the-art facility will be the gateway between UC Davis and a broad community of researchers, engineers, entrepreneurs, policymakers, and industry professionals, engaged in all dimensions of wine- and food science-related activities.

An engine for innovation, the complex will define a new approach to viticulture, brewing, and food science, changing the way our food, wine, and beer are produced in this country for years to come.



Project Overview



Objectives and
Challenges



Sustainable
Outlook

“This new facility raises the bar for environmentally conscious design and construction of laboratory and processing buildings within the University of California. It also will serve as a model for industries throughout the nation that are committed to both environmental responsibility and production efficiency.”

Neal Van Alfen

UC Davis Dean of the College of Agricultural and Environmental Sciences

Project Overview



Project Overview

The Teaching and Research Winery and the August A. Busch III Brewing and Food Science Laboratory (WBF) are vital additions to the Robert Mondavi Institute for Wine and Food Science (RMI). This pilot facility combines wine-making, brewing, and food processing capabilities with advanced research and teaching spaces. A resource for the entire industry, **the WBF also supports collaborations with the private sector and programs in public outreach.**

The WBF integrates bench-top science with applied process

technologies. Unique for its type and broadly transformative in its potential, this facility extends academic investigation to practical application. Here, researchers and students can directly test theories and validate new processes for cultivation and production in industrial conditions.

The building also educates students in sustainable production processes and operations. As a “living model,” energy efficient technology is implemented and monitored in this highly sustainable setting. **It houses the world’s first LEED Platinum winery, first LEED Platinum brewery, and first LEED Platinum food-processing pilot plant.**

“This new facility will be a platform for experimentation in wine processing, with the ability to measure energy and water usage, as well as waste output. Our students will study winemaking using the most advanced facility, with a focus on sustainability and precision in wine production.”

Andrew Waterhouse

*Marvin Sands Endowed Professor and Chair
of the UC Davis Department of Viticulture and Enology*



Institute Programs



Discovery and
Application



Sustainable
Possibilities



Project Challenges

Objectives & Challenges



A Showcase for Institute Programs

The WBF truly completes the Robert Mondavi Institute for Wine and Food Science (RMI). Made possible by the gift of a generous donor, the facility fulfills the university's ambitious vision: to set the standard for global innovation in wine and food sciences education; become a leader in industry research; and model sustainable production practices for its corporate counterparts.

Key Objectives

- **Provide distinct, clear identities for the Departments of Viticulture and Enology, and Food Science and Technology.**
- **Create a sophisticated learning environment for future industry leaders.**
- **Showcase the most advanced process technologies.**
- **Accommodate future program growth with an expandable building design.**
- **Physically connect research and production through a demonstration vineyard.**



A Venue for Discovery and Application

The university envisioned a facility where bench-top science was integrated with applied process technologies — **a place where research would serve California’s winemakers and farmers, and students would connect directly with industry experts and consumers.** The WBF achieves these goals by encouraging academic exploration, and promoting research into new processes for cultivation and production in an industrial setting.

Key Objectives

- **Complement the RMI with thoughtful expression of utilitarian functions.**
- **Reflect California’s warm, open, and contemporary aesthetic.**
- **Create an academic environment that is welcoming, sustainably designed, and easy to maintain.**
- **Incorporate stunning views of the natural landscape and work within established circulation patterns.**
- **Increase production capacity to accommodate more students and more activity.**



A Model of Sustainable Possibilities

The LEED Platinum certified WBF serves as a role model for the wine, beer, and food industries. Its construction methods and operating systems incorporate sustainable features that can be tested, modified, and eventually implemented as best practices. As advances are made in environmentally conscious technology, the building can adapt to demonstrate those advances, due to its flexible design.

Key Objectives

- **Monitor water and energy use, with an eye toward conservation.**
- **Reduce and reclaim waste output.**
- **Engage the landscape and respond to local climate.**
- **Mitigate freeway and railroad noise.**
- **Minimize distance to existing utility connections.**



Project Challenges

Working within ambitious budget and schedule parameters, the WBF met additional objectives unique to this project, including:

- Providing flexible, adaptable spaces that encourage experimentation and innovation.
- Demonstrating both standard and evolving systems technologies.
- Offering precise and variable control of environmental conditions within the building.
- Devising closed systems to reduce the risk of cross-contamination.
- Allowing visibility into fermentation laboratories without disturbing operations in any way.
- Integrating new and existing equipment into the facility design.
- Accommodating two brewing sessions per day.
- Creating food grade environments that would meet or exceed California Department of Food and Agriculture standards.

“Water conservation, energy efficiency, and waste reduction are issues that food and beverage processors confront constantly in their quest to be competitive. The new facility will showcase environmentally conscious, sustainable technology that others can put into practice in their own operations.”

James Seiber

UC Davis Chair of the Department of Food Science and Technology



Environmental
Preservation



Heightened
Performance



Integrated Design

Sustainable Outlook



Environmental Preservation

The global, multi-billion dollar business of beer, wine, and food production relies heavily on natural resources and energy-intensive processing to bring their products to market. Industry leaders acknowledge that their companies must find more sustainable methods in the future – to protect the environment, maximize efficiency, and produce less waste.

To that end, the WBF opens its laboratories to private sector colleagues. In this state-of-the-art facility, corporate researchers can test their own theories, while leveraging the knowledge and expertise of the university's faculty and staff.



Heightened Performance

The WBF is the first LEED Platinum building on the UC Davis campus and the third in California's state educational system. Housing the world's first LEED Platinum certified winery, brewery, and food processing pilot plant, it is also the first process science building to receive this rating. The university initially planned to meet a lower energy efficiency standard on the project, but industry leaders, who would ultimately benefit from the most advanced facility, contributed additional funding to reach the Platinum goal.

While the WBF educates students about sustainable techniques for cultivation and production, it also serves as a "living model," demonstrating the effectiveness of energy efficient technologies and construction practices.



Integrated Design

Design-build delivery was essential to achieve LEED Platinum certification within a lean construction budget. High net-to-gross efficiency in design (approximately 85%) aligned program needs, quality of materials, and budget. Accurate cost estimates reduced the need for contingency funds, and allowed more money to be allocated to sustainable elements. Close collaboration between the architect and builder ensured that all of the goals of the project, including extraordinary sustainability features, were met.

“We are excited that UC Davis will be taking the leadership role in sustainable viticulture and winemaking. It is essential for all of us to be good stewards of the land and leave it better than we found it.”

Barbara Banke, Jackson Family Wines and WBF Benefactor

“When we first started talking about making this a highly sustainable facility, some people thought it was a harebrained idea. But we were fortunate to work with encouraging and supportive people who saw the potential for this building.”

Roger Boulton

UC Davis Stephen Sinclair Endowed Professor of Viticulture and Enology





Andrew Cunningham, RIBA, LEED AP, Principal, Flad Architects

Andrew Cunningham appreciates the built landscape. Growing up in Scotland, he studied the storied architecture of that country, from its historical monuments to the evolving contemporary architecture. Today he helps shape the landscape of his new home – California – preserving what is historically interesting and important, while planning for a dynamic, environmentally responsible future.

“I’m very proud that, through this LEED Platinum certified design, we’ve had such a positive impact on an entire commercial sector – it illustrates what can be done right now to improve processes, increase efficiency, and mitigate the environmental impact of food and wine production. Perhaps best of all, I know that the students who come through this program, who work and study and learn in this lab, will make even greater advances. With every new discovery, they will have a profound effect on the future of the industry.”

Andrew Cunningham, *Flad Architects*

Mr. Cunningham has more than 25 years of experience with research and development projects for private and public sector clients. He has served as project manager for an array of building types, ranging from pharmaceutical/biotech research and manufacturing plants, to vivaria and specialized containment facilities, as well as academic, retail,

hospitality, and office buildings. The Teaching and Research Winery and the August A. Busch III Brewing and Food Science Laboratory at the University of California, Davis, is his first foray into structures designed for cutting-edge viticulture and food processing.

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