

Flad's work for the University of Wisconsin Department of Chemistry is a story of transformation and rebirth. This project marks a renewal point in the program's research and instructional facilities.

In designing a new research tower, lab renovation, and lecture hall for the Department, the architects were inspired by the scholars who work there. "This is a group of incredibly bright and talented people," says Flad design principal, David A. Black, AIA. "The building is intended as a simple statement about who they are and what they've achieved." Department achievements include two Nobel Prizes and a recent MacArthur Fellowship, popularly known as a "genius grant." Yet for years, faculty and students have persevered in 1960s-era buildings with windowless labs and outmoded safety provisions.

## A New Downtown Presence

The Chemistry Department's mission is three-fold: to provide a basic understanding of chemistry to undergraduate students, to develop a strong knowledge foundation for those who go on to the other sciences, and to create an investigative work environment for those doing research in various aspects of chemistry.

Occupying most of a city block, what is collectively known as the Chemistry Department is actually multiple buildings. The buildings together house undergraduate and graduate organic and inorganic synthetic, analytical, basic research, and physical chemistry labs.

*Essentially three primary parts to the multi-phased project were undertaken:*

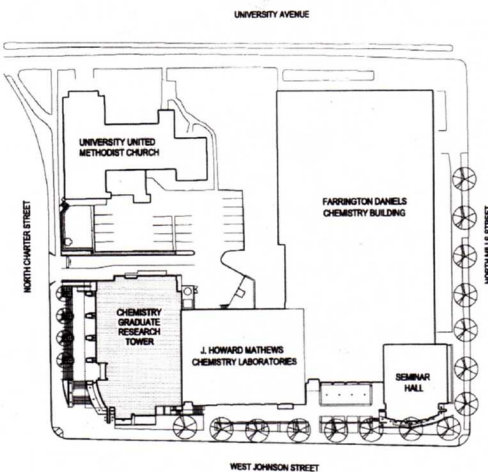
- *design and construction of a new research tower to the west of the two existing facilities*
- *design and construction of a new lecture hall*
- *renovation of existing 1960s-era Mathews & Daniels buildings*

Now, well ventilated, daylit labs and an elegant new lecture hall provide more inspiring settings for the work of the Department.

## The Power Tower

A state-of-the-art research tower on the southwest corner of the site was completed first and provides new graduate research labs and support space, an instrument center, and imaging facilities.

A two-story atrium of glass, wood and stainless steel marks the tower's entrance. The materials and forms express the dynamic character of the Department, using verticality as its main metaphor of celebration. "At every opportunity," says Black, "design decisions emphasize the tower's lightness and height. On the west facade, dominant vertical fins divide the building's width into tall, slender shafts, while a rhythm of horizontal bands reinforces the impression of height."



At the tower's southwest corner, a floating corner was created by employing a steel transfer truss, which gives the look of a "missing" column. This levity not only marks the building's main entrance, it contributes to the sense of loft created by the surrounding vertical elements and generous glazing.

*Flad's bold design transformed a dilapidated urban site into a compelling and vibrant statement for contemporary chemistry.*

Professor Robert J. McMahon  
Dept. of Chemistry

Driven by the more hazardous research activities of the chemistry program and health and safety issues, the expansion provides labs for the synthetic chemistry program. The new research tower was used to establish quality standards for these and future renovation phases, while enhancing the instruction and research capabilities of the department.

The 16-foot, floor-to-floor height of the addition allows for mechanical systems and accentuates its stature relative to the 12-foot, floor-to-floor height of the existing facility. The contrasting imagery of the new building expresses the excitement and discovery of the chemistry research within.

### Keeping It Clean

A state-of-the-art air handling system, required to ventilate fumes from the research labs, adds to the building's height.

Air can run through the labs only once, but the administrative and instrument spaces, housed on the bottom two floors, have less stringent needs. Inserting a layer of mechanical equipment between the second and third floors permits a single system to send fresh air upward to the labs, and recirculated air downward to the administrative and instrument spaces. At the same time, this placement ensures that air intake vents are raised above heavier, hydrocarbon-laden air from traffic outside.

A 20-foot-high screen wall that conceals exhaust ductwork on the roof also unifies the facade and caps the building, while contributing additional height.

This new tower for the Chemistry Department is significant because it does several important things:

- The new labs benefit from an improved ventilation system, in which each student gets their own chemical fumehood, which ensures that their air is well-ventilated and safe to breathe.
- Student desks are located in separate offices adjacent to the active laboratory. Separate students offices are not only incorporated in the new addition, but they are being incorporated in the existing buildings during the renovation project. Although separate, the offices provide good visibility into the laboratory. Previously, student's desks were located directly inside the active laboratory.



# the facility story

· Even before the building opened, it had already fulfilled one of its goals: to recruit and retain outstanding faculty. The promise of new facilities helped retain five top faculty members who received outside offers during the past few years, and helped recruit five new faculty to the Department. Retaining and recruiting top faculty benefits not only the Department but the University as a whole, and even the community.

· By attracting and keeping top instructors, the thousands of students who study chemistry at UW benefit. Since chemistry is the foundation of many other sciences, including biotechnology, computer science, and material science, this new facility helps the UW remain at the forefront of education and research in all these important sciences.

· The addition also improves the urban environment, replacing a small surface parking lot and two nondescript old houses, thereby creating a completely new presence for the Chemistry Department on the main thoroughfare.

The research tower was dedicated in October 2000.

## Old Becomes New Again

Before the new research tower was even complete, renovation of the existing Mathews & Daniels buildings was underway. Renovated laboratory space enhances graduate research and better serves the 427 faculty, staff, and post-docs who occupy the facility.

Remodeling of the existing research laboratories was a priority and included increased fumehood access for students at workstations, as well as installation of localized benchtop exhaust systems. The renovations not only addressed safety concerns, but also brought state-of-the-art equipment to the facility.

The third phase of the project renovated the north half of the Mathews building, removing student desks from lab space, creating student offices and apparatus labs in a module adjacent to the lab. The number of students was reduced to create a better ratio between fume hood and bench space per student. The north half uses a single supply air unit, thus dictating the decisions made regarding renovation. An exception to this strategy was the second floor which renovated the south half of this floor to allow relocation of two NMRs from the north side.

## Lecture Hall

The additional seminar hall helps serve the 4,000 students who daily use the classrooms each fall. The Seminar Hall works with the new Research Tower to “bookend” the buildings. The effect is to bring new construction to both corners so existing buildings are embraced by new. The existing building exteriors remained without upgrade.

# the facility story

The location of the Seminar Hall is ideal, placed at the intersection of the two primary corridors of the building. One serves the undergraduate teaching spaces, while the other primarily serves the graduate students in the Research Tower.

Because the grade of the site falls by 12' along the length of the block, the Seminar Hall is entered from the corridor at the top row of seating. The presentation platform is at street level, resulting in accessible seminar space in which egress flows naturally and easily outward.

A stairway which gives access to the main floor of the building is expressed as an outwardly curved form. The transparent ends allow for views up and down campus as well as views inward to the vibrant interior. It is illuminated at the perimeter, giving the ceiling a buoyant quality.

## Now Hear This

Inside the lecture hall are materials selected for both their aesthetic and acoustic properties. The hard surfaces — the vaulted ceiling, the floor-to-ceiling cheek walls to either side of the podium, and the lower portions of the side walls — project sound out into the lecture space. The side walls cant back to avoid the echo that parallel walls would generate. Six-foot wood paneling guards against scuffing on the lower section of those walls.

Contrasting with the warm, pearwood-stained maple, and installed in the upper portions of the side walls, an innovative application of “sintered” aluminum enhances the hall's acoustics. Although widely used in Japan, this material is just beginning to find applications in North America, and this is among the first.

This material is made from aluminum which has been coarsely ground and then pressed together to form a thin, brittle, yet porous panel. Its acoustic properties derive from this irregular porosity. When used in this application, the material allows sound to pass through it, but the sound becomes trapped, unable to return.

This application of sintered aluminum works metaphorically as well as acoustically, according to Black. He says: "In its combination of nature and technology, the material expresses the Department's work of investigating the natural world and applying discoveries in innovative technologies."

## Conclusion

The completion of the seminar hall and related renovation marks the conclusion of long-awaited renewal for the Department of Chemistry.