

# HEERY INSIDE

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## A Flexible Master Plan Helps Yale New Haven Hospital Expand into the Future



When Yale New Haven Hospital (YNHH), the primary teaching hospital for Yale University School of Medicine, needed to expand in 2008, it faced some major dilemmas. Not the least of which was a circular, unforgiving footprint. The 2.5 million SF facility housing 944 beds had for 50 years grown in a pinwheel pattern, adding East, West, South and North pavilions, or quadrants, around a central atrium. By 2008, when the need for more beds demanded a fifth pavilion, there was no room left on the pinwheel.

"They really didn't know how to grow," says Andre Zlotnicki, lead project planner from Heery International.

Heery is part of a multi-firm team engaged in 2008 to create a new master plan that would map out the hospital's growth until 2017. "They'd completed the circle and felt stuck."

Heightening the pressure was the dense urban fabric surrounding the hospital. YNHH had worked closely with the mayor and city planners to make sure growth did not disrupt the community, yet the only additional land owned by the hospital abutted a residential neighborhood.

New thoughts surrounding the issue emerged, according to YNHH's Director of Facilities, Design and Construction Brad Bevers, when the Heery team arrived to interview for the job.

"Other firms talked to us about what we thought was our direction. Heery came and spent time looking around and then told us why we might not want to go in the direction we'd had in mind," Bevers offers. "That kind of creativity and open-ended thinking sold the hospital's management team that Heery was the firm to work with."

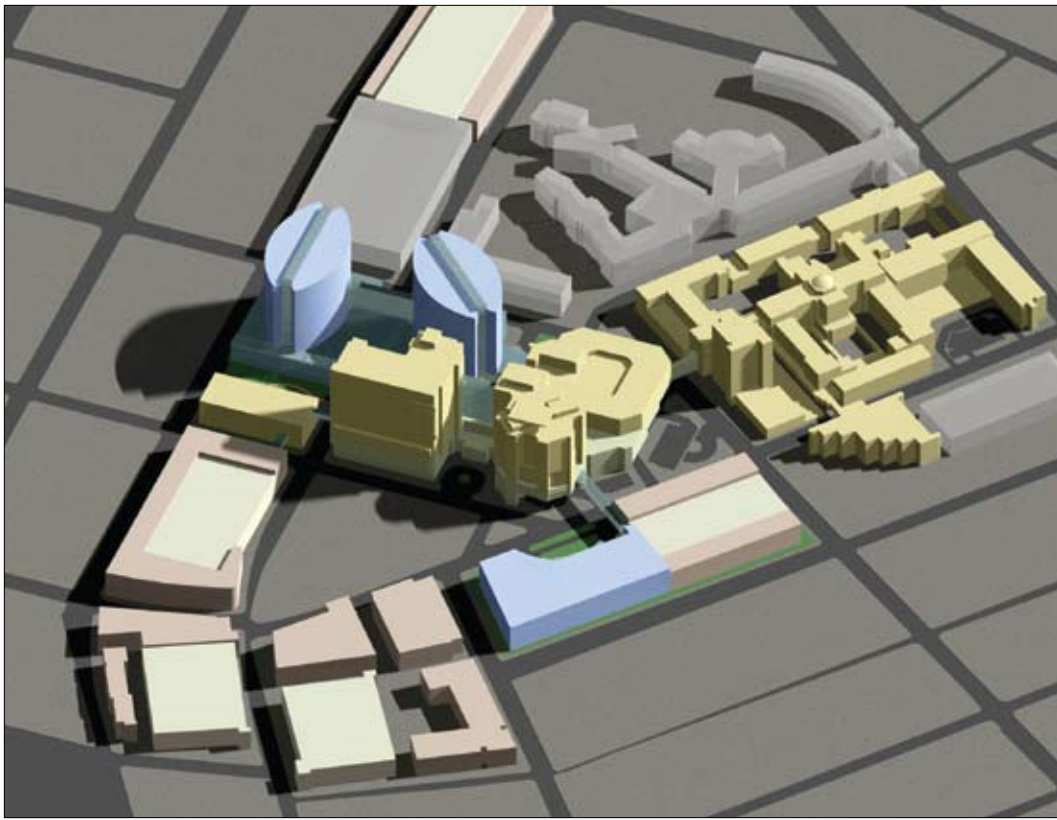
Along with planning team members, Kurt Salmon Associates, a leader in academic medical center programming, and PWI Engineering, Heery launched into the nine-month planning project completed in September 2008. Rather than a single solution, the master plan provided multiple options for increasing the existing facility to 3.5 million SF, maximizing the number of private patient rooms, demolishing and building a new East Pavilion and expanding the hospital's capacity to deliver more outpatient services through a larger ambulatory care network.

One of the central focuses of the planning was how to add the fifth quadrant even though there was no space within the existing circle.

"It took a unique solution to break out of the box they were in," offers Heery's Doug Infelt. Infelt has served as

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project planner involved with programming and strategy. “Instead of adding a piece onto the box, we changed the shape of the box.”

Heery developed the concept of a linear concourse or “healthcare mall” leading from the inner ring of pavilions to a new “outer ring” where patients would find the fifth quadrant. Though breaking away and outward from the original core of pavilions, the new quadrant would appear to patients to be a seamless and coordinated member of the circle. Existing color palates and materials throughout the new concourse and quadrant would create a sense of continuity.

“Introducing this outer circle concept struck a note with the hospital on how they could grow,” Zlotnicki says. “We developed the concept into three different frameworks, each one proposing a separate longitudinal direction in which the hospital could choose to expand, but each exploring this linear growth from inner to outer circle.”

One framework created a “medical city,” including a parking garage and hotel where patients can stay with their families at less expense as they receive extended treatments, and doctors can hold seminars and conferences. Another called for demolishing a barren wall of existing parking garages, allowing the hospital to grow northward, reaching out to the Yale University campus. Still another focused on developing the most readily available pieces of real estate.

This kind of optional fluidity is exactly what the hospital needed rather than a single static master plan, according to Bevers.

“We don’t know necessarily which properties will be available to us – or if we’ll need to move quickly,” Bevers adds. “We have a preferred direction but we have options now: if A doesn’t work we can move to B, and with a 2017 time frame we’ll be able to move thoughtfully. We have creative ideas that are workable.”

“This master plan had to be a dynamic document that could change and flex into the future,” Infelt

**“Instead of adding a piece onto the box, we changed the shape of the box.”**

confirms. “We made sure the hospital had alternatives so it can stay flexible and address multiple civic and political concerns.”

Historically, hospitals have looked inward, neglecting streetscape and street life, but in this case Heery worked with the city to develop a plan that creates a “friendly front face,” according to Zlotnicki. In addition to retail on the street side, such as a pharmacy and café that serves both patients and pedestrians, the frameworks propose screened parking garages and incorporate visual and structural elements unique to New Haven.

“New Haven has a lot of flying bridges over the streets – it’s a real New Haven thing – so we’re continuing that with skyways over the street connecting the existing pavilions to the new bed towers and the ambulatory care building,” Zlotnicki says. In addition, underground tunnels dating back to World War II that connect the buildings will be retained to bring in additional services and utilities, easing traffic overload. “Anytime you can move services, deliveries and

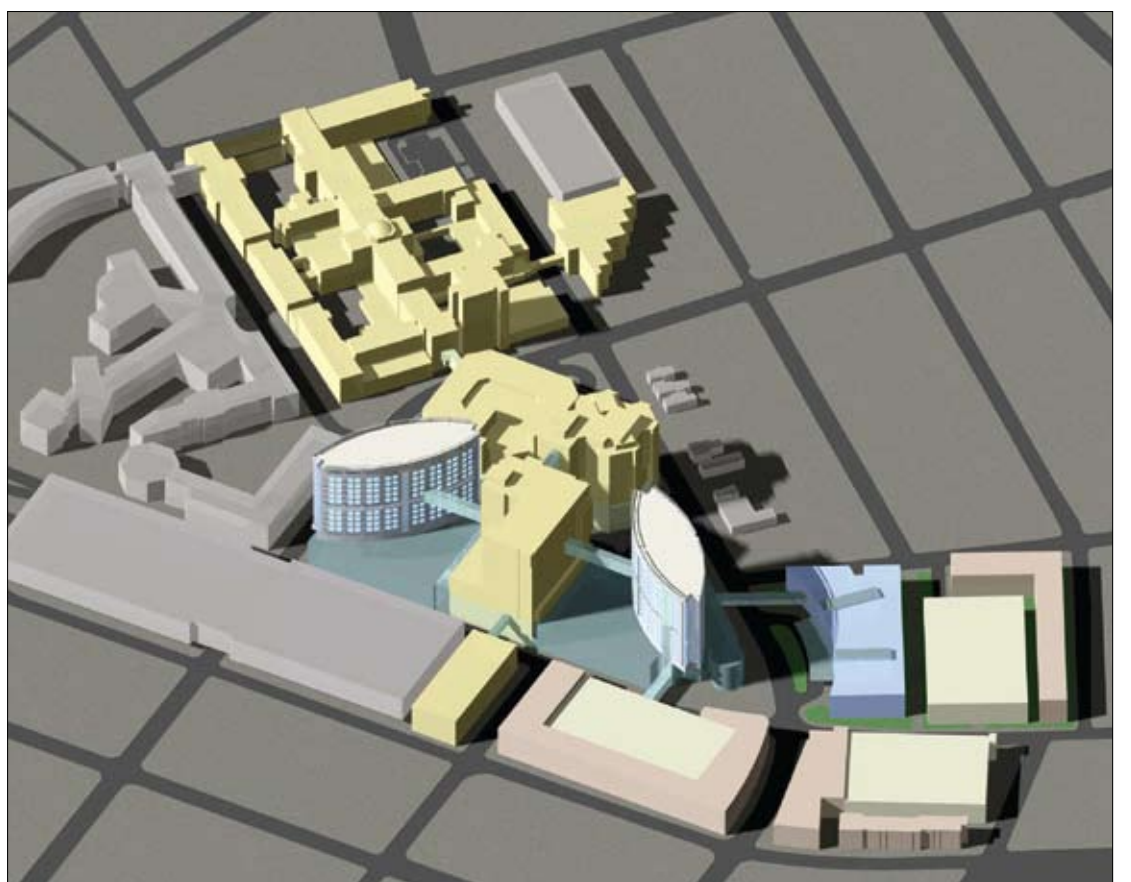
distribution of supplies underground within the hospital campus, it alleviates congestion on the street level and frees it up for pedestrians.”

After completing the initial frameworks, Heery was asked to develop a more specific master plan for the hospital’s radiology department. The goal was to create the first

building block of a new Heart and Vascular Center of Excellence by integrating several radiology modalities under one umbrella. It is part of YNHH’s initiative to reorganize traditional departments into distinct service lines, including cancer, children, neurosciences, transplant and heart and vascular.

“This is representative of how the practice of medicine is evolving,” Zlotnicki observes. “In effect, YNHH is creating hospitals within a hospital.”

That first hospital within a hospital is taking shape. The Heery team recently designed a new three-story glass atrium with a suspended canopy gateway for the Heart and Vascular Center of Excellence. The flowing light accentuates the entrance and gives the center the distinctive identity that will help Yale continue propelling its healthcare services into the future.



# New Student Union Enhances Activities at California State University, Los Angeles

“The greater the obstacle, the more glory in overcoming it.” Officials at California State University, Los Angeles

(CSULA) could not agree more with the French Playwright Moliere’s ancient quote. After all, they knew the obstacle too well. The university’s Student Union, constructed in 1975, was about to undergo a much needed renovation. A seismic analysis, however, revealed that the building wouldn’t perform well in case of a seismic event. Having witnessed the more than \$20 billion in property damage caused by the 1994 Northridge Earthquake, administrators decided to demolish the facility in 2005 rather than restore it.

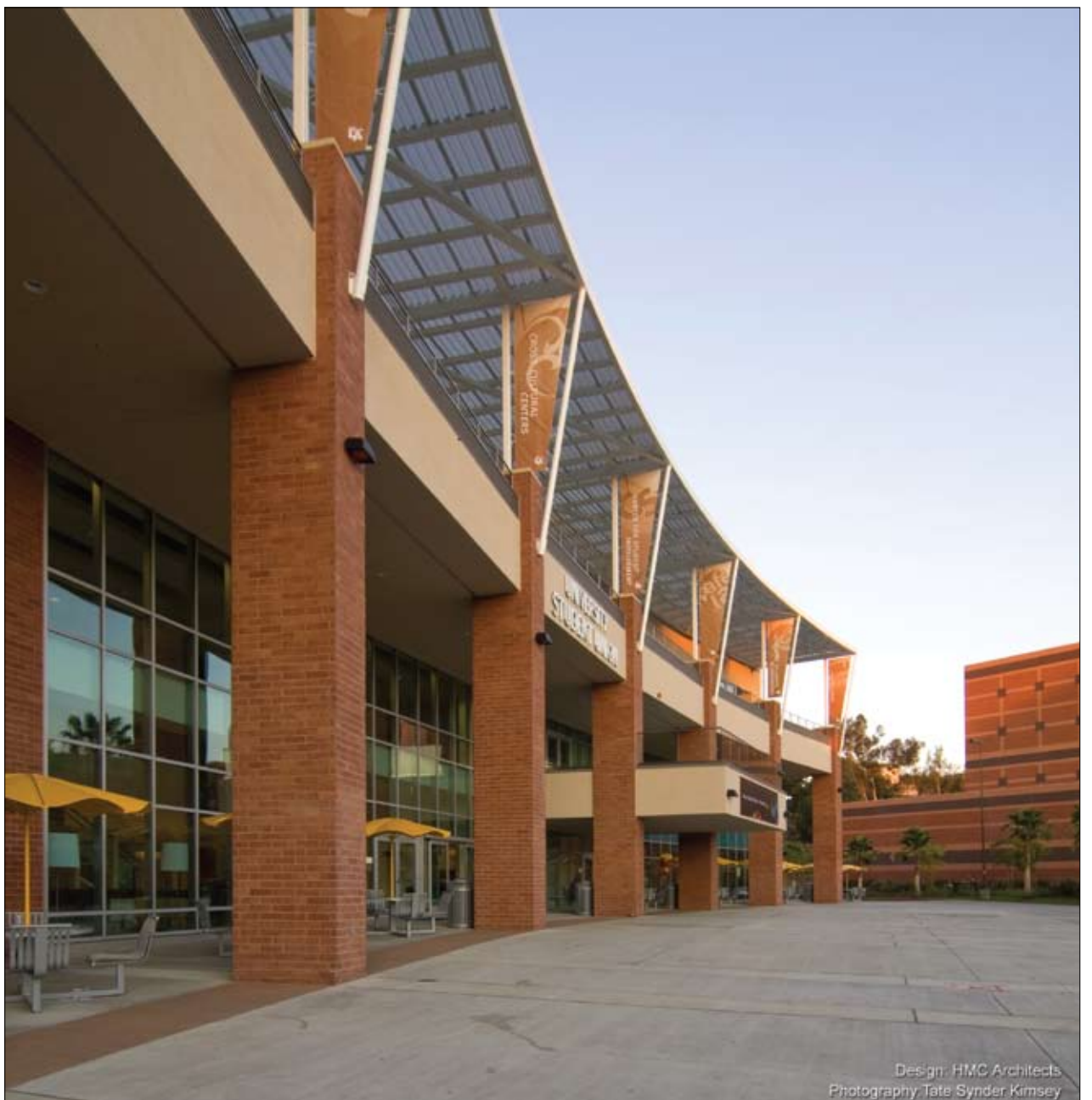
Recognizing the need to resurrect the facility, CSULA hired Barnhart, Inc. to provide design-build services for a new 100,000 SF Student Union that would serve as the heart of campus activity. “Building a physically impressive building that would provide a stress-free source of educational inspiration and, at the same time, withstand considerable seismic activity, was our primary goal,” says Barnhart, Inc. Vice President Sean Hulen. “The university also placed great value on energy and cost efficiency.”

Of course, before construction work could begin, the old cast in place concrete facility had to be demolished. “The old Student Union was only 15 feet from another campus building,” Hulen says. “We had to be incredibly careful, taking the 110,000 SF building apart piece by piece to avoid any disturbance or damage to the other facility.” The

majority of the demolition took place during the summer when fewer students occupied the campus.

The original master plan, which encompassed the neighboring Golden Eagle Student Service Building plus the Student Union, called for the new facility to have three

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stories plus a basement. “In the original plan, the basement was only 50 to 60 percent of the footprint,” Hulen offers. “After studying the plans, we determined we could move one of the air handling units onto the roof, among other things, and give the university 100 percent of the footprint in the basement.” Barnhart’s maneuvers also allowed the gym, which had been split into two floors in the master plan, to be housed on a single floor.

The \$31 million facility, which combines an innovative and structurally sound interior with a sophisticated, aesthetically façade, was designed by HMC Architects. “The thinking, design and construction that form the Student Union were very much ahead of the time,” says Joseph Aguirre, executive director of University-Student Union & Student Life. A glass clad exterior bathes the offices and lounge spaces in light, while providing views of the surrounding campus and community. “Inside, the exciting design brings a fresh meaning to the idea of student activities.”

What makes the project particularly innovative is the structural engineering team’s decision to use a new technology called “SidePlate,” which was developed following Northridge Earthquake studies. This new lighter and more flexible steel connection technology was designed for use on structures built in high seismic activity areas. “Because the SidePlate system creates a building that is more flexible, the exterior skins needed to allow for more movement than any building I’ve constructed in the past,” Hulen says. “We spent a great deal of time and effort working with the designers of the wall and window systems to make sure that movement was built-in.”

**The technology also created a design benefit – using less steel allowed for more interior space, adding another avenue for creating the ideal, open and inspiring learning environment.**

Not only did the design-build team’s use of SidePlate help them erect a sturdier facility, it also helped them generate significant cost savings because this technology required less steel. Barnhart redirected the SidePlate savings into other high-quality enhancements that had been in the owner’s original RFP but had been taken out to meet budget requirements. “We were able to upgrade the millwork and tile finishes in the lobby, add brick and stone veneers on the façade and add more curtainwalls and windows,” Hulen notes. The technology also created a design benefit – using less steel allowed for more interior space, adding another avenue for creating the ideal, open and inspiring learning environment.

While the university was not seeking LEED Certification, it did require the building to be designed in as sustainable a manner as possible. “The university let us know they had excess capacity in the central plant and excess capacity in the neighboring theater facility,” Hulen notes. “We tied into those chilled water lines and boilers to provide the majority of the student union’s heating and cooling capacity.”

Both the university and the Barnhart Design-Build team are basking in the glory of overcoming the Student Union’s construction challenges. In fact, the project has earned formal recognition with a Merit Award in the National Design-Build Institute of America’s (DBIA) 2009 Project Awards. DBIA honors builders for their advanced and innovative application of total integrated project delivery and ability to find unique solutions to project challenges. Of course, the happiest winners are the CSULA students who now have a state-of-the-art Student Union that will serve them well for years to come.

## Caltech Strives For LEED Platinum On Linde + Robinson Lab Renovation

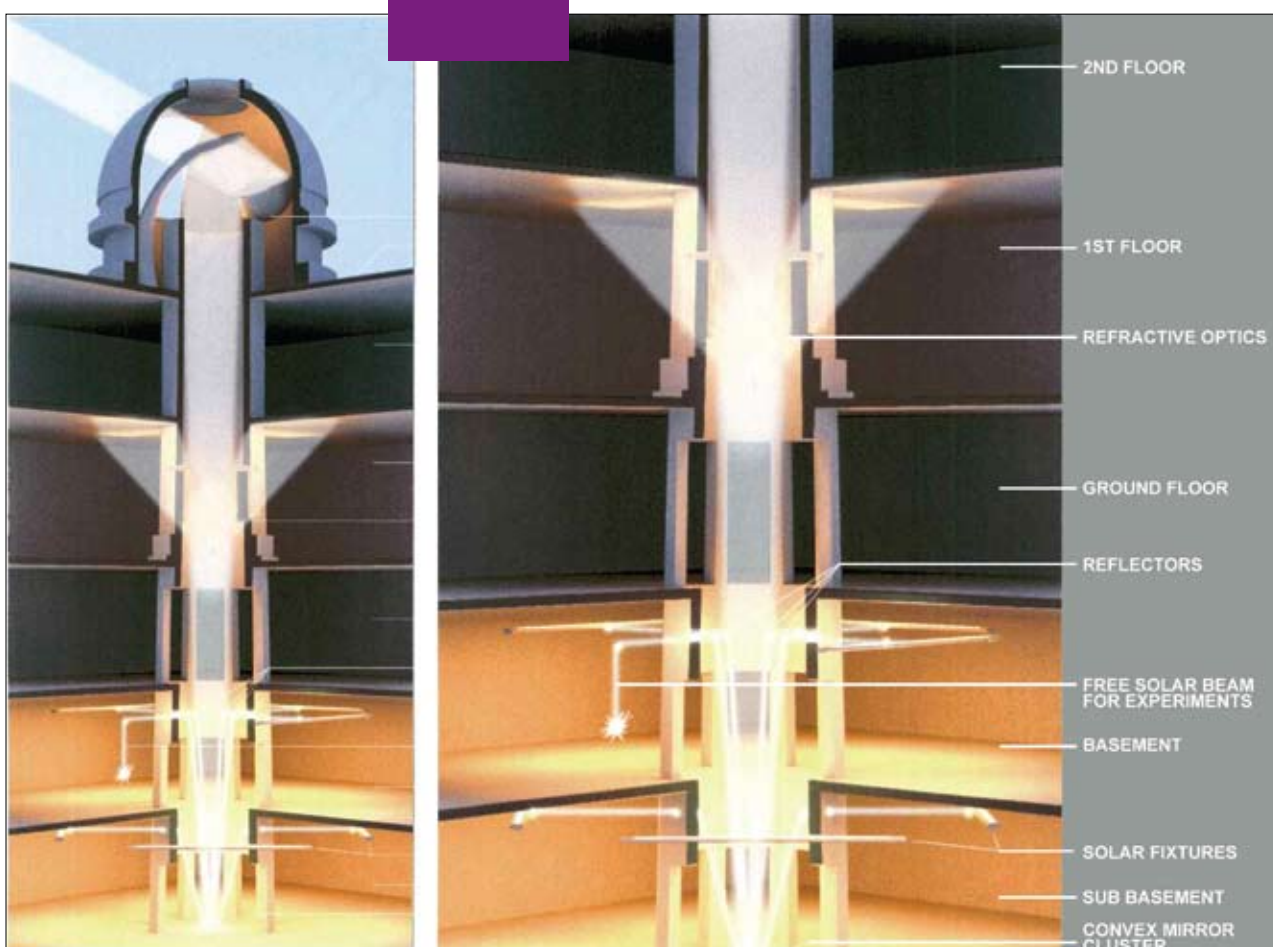
Having successfully moved its Astrophysics staff from the old Henry M. Robinson

Laboratory of Astrophysics into the new 100,000 SF Cahill Center for Astronomy and Astrophysics, Caltech is

now focused on renovating the more than 75-year-old facility. The 45,000 SF laboratory was built to manufacture and house a 200-inch telescope, the world’s largest at the time.

While other current campus construction projects are targeted for LEED Gold Certification, exceeding the city of Pasadena’s sustainability goals, Caltech is going for Platinum in its renovation of what will become the Linde + Robinson Center for Global Environmental Science.

“The Robinson Laboratory has undergone many minor changes over the years, but this is the first complete renovation and upgrade of the entire structure and supporting systems,” says Heery Project Manager Bart Hale. “Once the work is completed, it will house laboratories for the university’s newly formed Center for Global Environmental Science, which combines geochemistry, microbiology, and atmospheric and oceanic science.”



One of the more unique elements of the project is the continued use of a solar telescope that was part of the original 1932 construction. Once the controls are updated, the new telescope will direct the sun's rays down a shaft to a series of mirrors and lenses that will distribute the rays to lighting fixtures and prisms. These will be used to illuminate portions of the sub-basement and basement levels.

"While Caltech's Platinum goal is lofty, the university has already modified its standards to reduce water and energy usage even further," Hale says.

Architectural Resources Group, the architect, is specifying regional and sustainable materials while Rumsey Engineers and Integrated Design Associates, the mechanical and electrical engineering consultants, have designed efficient systems that meet the stringent space programming requirements, such as separate air handlers for offices, labs and clean rooms.

The contractor has committed to diverting 95 percent of construction waste materials from landfills. Completion of the Robinson + Linde Laboratory is anticipated in 2010.

**"While Caltech's Platinum goal is lofty, the university has already modified its standards to reduce water and energy usage even further."**

## What is all the Hoop-La About?



Georgia Tech's new practice facility enhances player development and recruiting.

Being a student athlete at a major university has its share of rewards and drawbacks. While the thrill of the game sets competitive hearts pumping, the hassle of rearranging class schedules to suit practice requirements can send those same hearts plummeting.

Georgia Tech basketball players have known both the highs and lows. Up until recently, the practice facility had been perceived as being too small. The men's and women's teams both relied on the school's coliseum as their preferred practice facility. "While both teams had full use of the competition floor, only one team could practice at any given time," says Heery International Architect Jim Curry. "Students often had to work their academic schedules around the team's practice schedule."

When the university tasked Heery with completing a feasibility study for a new practice facility, its mission was clear. "We had a clear cut goal of allowing both the men's and women's team to practice simultaneously," says Georgia Tech Director of Athletics Dan Radakovich. "We also wanted to incorporate a video teaching area as well as weight room in this new building. Videos used to be shown in the locker room versus a facility where you could teach, watch and execute. To be able to see a video, and then be in the place where you can implement what you've learned in about ten steps is vital for player development. To be able to go from your work in the strength and conditioning room to the practice floor is just as important."

Private funding from donors Steve and Judy Zelnak allowed the project to progress from feasibility into design. "Because we were landlocked, we knew from day one we had to be very efficient in our design to house not only the practice gym, but a strength and conditioning area as well as teaching theater," Curry says.

The 20,000 SF facility connects to the southeast side of Alexander Memorial Coliseum and houses one full-size basketball court with eight baskets, 24-seat teaching theater and a 2,500 SF strength and conditioning room. Georgia Tech required the project to target LEED Silver

Certification, but the design team believes it will achieve Gold without any additional expense.

The ample natural light that streams into the practice gym does more than just earn a LEED credit. "Research has shown that well-lit facilities enhance performance," Curry adds. "Beyond the ample windows, we separated the gym and strength and conditioning areas with glass to provide coaches and students with maximum viewing opportunities. Blinds have been built in to separate the men's and women's teams when needed."

"The Zelnak Center's design is very efficient and allows us to have maximum flexibility," Radakovich offers. "I believe it will help us in the recruiting process as it provides a better front door into the coliseum for our student athletes," Radakovich says. "Having the practice facility and coliseum under one roof is phenomenal."



# Higher Education “Question and Answer”

Rod Rose is a strategic consultant at Los Angeles-based Stratus, a division of Heery International. He is a former president of the Society for College and University Planning (SCUP) and was executive editor of the SCUP’s journal for seven years. He was the lead author of the book,



*Buildings: The Gifts that Keep on Taking*, published by the Association of Higher Education Facilities Officers (APPA) Center for Facilities Research. The book was based on a four-year research project to examine the critical issues facing owners and policy-makers who invest in facilities development and produce a model for strategic asset investments based on best practices resulting from the research.

## **Q: What is the primary message you want to convey to readers?**

I’d like readers to understand that owners and policy-makers need to know the total costs of facilities ownership, and account for such costs as part of their underlying decision-making before launching any major facilities project. Our research shows that most of the time and energy of these executives is devoted to the first costs of developing facilities – determining the right project, obtaining financing, obtaining approvals for design and environmental impact, and outlining the design and construction process. Together, these comprise little more than 30 percent of the total cost of owning and operating most major buildings. The rest of the costs are related to ongoing operations, and the maintenance and capital renewal that must occur periodically throughout the life of a building. Many universities and colleges are fortunate to have generous donors who provide funds for some of their most significant buildings. With rare exception, these funds are only given for capital development costs. The institutions are left with the responsibility for costs of operations and renewal in perpetuity. The same is true for buildings funded by public bonds or state funds, which fund only capital costs. Operations and renewal must generally come from operating budgets as well.

## **Q: What are the most important facilities issues of concern to senior executives of higher education institutions?**

In dozens of interviews with higher education institution executives, there was a broad consensus on seven key issues faced in every decision to launch major projects—the need to:

- Gain more control of initial and long-term costs
- Improve the predictability of desired outcomes

- Develop a more rational basis for determining facility priorities
- Have more cost-effective and adaptable facilities
- Improve the use and functionality of space
- Improve accountability to the institution’s trustees or regents as well as legislators and the public at large
- Attract more support and resources for facilities, whether new construction, renovation, maintenance and renewal

Again, these concerns are just as relevant to policy makers of any organization or government agency with large facility portfolios.

The common thread among these issues is that facility decisions must be perceived as an investment for an owner or institution. The process of planning, designing and constructing major projects can take many years. During that time, unforeseen conditions can result in change orders, increases in costs, turnover of involved personnel and countless frustrating incidents that distort a project’s expected end results. This book is intended to provide all executives who initiate major facilities projects with a set of simple tools to better understand and articulate the investment value of those decisions.

## **Q: What are the key elements of an effective asset investment strategy?**

Any asset investment strategy must stem from understanding the answers to four critical questions:

**Why should we invest?**

**What can we afford?**

**Where and when should we invest?**

**How much should we invest?**

While these questions may seem obvious, there is little evidence that higher education institutions or other owners of major facility portfolios have or use credible analytical tools and data to answer them. Facilities investment decisions are often made on the basis of competing internal pressures, available external opportunities, the desire to maintain competitiveness and the need to replace or renew outdated facilities. While these are certainly important and sound reasons for launching major facilities projects, these reasons are not normally accompanied by readily comparable data that can directly translate to the investment value of those projects. What is needed – and is provided in this book – is a set of critical information or data sets that have been determined to be most relevant for investment decisions. They include a common language of terms and

definitions used to define facilities elements, a methodology for determining strategic priorities, and facilities performance data that will allow decision makers to understand how a facility and its subsystems are expected to perform, compared to how well they actually do perform.

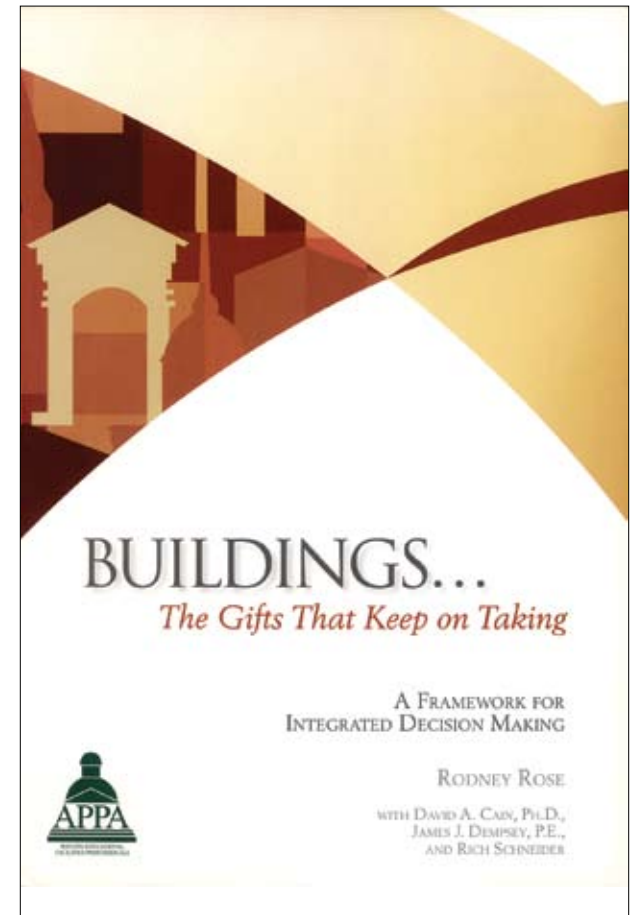
We have found in our research that institutions and government agencies that regularly use comparable data and have a clearly defined methodology for determining facilities priorities are more apt to attract resources, and win support for projects from regents, trustees or state legislatures.

**Q: Your book proposes a strategic investment model that senior executives can use to evaluate alternative facilities strategies. What are the advantages of using this type of model?**

First, this strategic investment model and asset investment strategy is intended to assist higher education policy makers (e.g., presidents and chancellors, boards of trustees, legislators, etc.) to better understand the impact of major decisions on such key issues as resource allocation, building design criteria, recruitment and retention of faculty and students, construction strategies, the nature of the learning and research environment and accountability measures.

A strategic investment model helps administrators and policy makers set priorities for any given capital project based on making the best business case for each project. The business case is predicated on an organization's primary mission and goals, and the performance indicators or characteristics required to measure how well the organization achieves those goals. Second, it provides quantitative indexes based on best practices found in our research for evaluating asset investment priorities and mission-related dependency of any project. Third, it affords simple tools to determine the life cycle of buildings and subsystems. The analysis of predictable life cycle costs drives much of the tremendous backlog of deferred maintenance that exists across the nation. Calculating these costs is essential for understanding the expected performance characteristics of any facility.

*Buildings: The Gifts that Keep on Taking* is available for purchase online at [www.appa.org](http://www.appa.org). Simply click on "bookstore." It is located under General Administration & Management.



## Texas Awards

Two Heery-designed university sports projects tied for Best Sports/Recreation project in Texas Construction magazine's Best of 2009 awards program. The winning projects were Darrell K Royal Texas Memorial Stadium, North End Zone Expansion in Austin and the Texas A&M

University McFerrin Athletic Center in College Station. In addition, Heery's sports design group was a member of the team that was awarded the Excellence in Renovation/Restoration for Phase 1 of enhancements for Texas State University Baseball/Softball Complex.



# Happy Times Ahead at EATM



Program management can sometimes seem a lot like wrestling alligators. No one knows that better than Heery Project Manager Dick Jones. While Jones isn't exactly

wrestling them, he is helping build a new home for Happy, the six-foot long resident alligator at America's Teaching Zoo, where students are enrolled in the Exotic Animal Training and Management program (EATM) at Moorpark College. EATM is the only college program of its kind that trains students for careers working with animals in television and film, zoos, theme parks and more. The zoo, which sits just above student parking on a quiet hillside overlooking California's beautiful Simi Valley, has been getting a much needed facelift in addition to a new classroom facility.

"As we were working on front entry repairs, we noticed cracks in the sidewalk from assorted tree roots," Jones says. "We couldn't replace the sidewalk without moving Happy from his home." EATM officials, in the meantime, had long harbored hopes for creating a larger and more visible habitat for Happy. "I was personally excited when the school decided to move Happy near my favorite tortoise where more visitors will be able to see him. We went back to the drawing boards with the architect, who designed a 12ft. by 12ft. pond, including beach space for lounging in the sun. The additional design was then incorporated into the bid package."

**"We've been told that Happy's larger home will allow him to grow another six feet in length."**

While Happy was carefully relocated to temporary housing, the design and construction team went to work. "We had no idea of the water, sewer and storm drain lines that were located beneath Happy's new home," Jones notes. "Our only option, since there were no other site possibilities, was to relocate those utilities."

The prospect of regularly emptying and maintaining a 1,500 gallon pond gave the school and construction team additional cause for concern. "Emptying the pond on a weekly basis would not be an environmentally sound decision," Jones

says. "We also needed to avoid the risk of bugs and algae growth associated with allowing water to stagnate." Zoo Operations Supervisor Michlyn Hines and Jones believed the best solution was a water filtration/re-circulation system. In researching options, the team learned that chlorine can be harmful

to alligators. "Consequently, we had to find a system that functioned without chlorine."

Currently, a special finish is being applied to the surface of the pond to keep Happy from slipping. "We've been told that Happy's larger home will allow him to grow another six feet in length and still fit comfortably in his pool," Jones says. "We've also been told that alligators have the ability to climb their walls, so we're turning the wire on the chained link fence inward." With a targeted fall completion date, EATM staff and students are certain that Happy days will be here again soon.



## University Creates Educational Opportunities to Boost Local Economy

All universities have three major missions: teaching, research and public service.

For the nation's urban universities such as Wayne State University (WSU) in downtown Detroit, the third is particularly intrinsic and fundamental. Along with urban institutions such as Temple University in Philadelphia and University of Cincinnati in Cincinnati, WSU considers itself inseparable from the economic and social issues that surround its campus.

"By their very nature these powerful universities are expected to play a role in the quality of life in their region," says Sal Rinella, a strategist from Heery International who is

one of a three-member team engaged in a planning project to assess and identify opportunities for WSU to better serve its community.

Specifically, WSU is looking to address the needs of Macomb County, a community outside Detroit especially hard hit by global economic challenges, including the loss of manufacturing jobs from the automobile industry and other industries. It is imperative for Macomb County, like other counties across the country, to convert from a manufacturing to a knowledge-based economy. However, the transformation will not be easy. The area has no four-year college, and, historically, has one of the largest

populations of adults without bachelor's degrees.

Seeking help, community and business leaders in 2007 approached WSU. Heery was engaged by the university to conduct a five-month strategic planning project to help determine how Wayne State might effectively support vibrant economic growth in Macomb County.

"Higher education is a catalyst for changing the work force and boosting the economy," confirms Rinella. "WSU wanted to determine the best approach for applying its intellectual capital to Macomb County."

### The Power of the Question

The critical first step of the planning project was to understand all of the competing interests and what each group cared about, according to Rinella. He and Heery team members Rod Rose and Judy De La Cruz began by posing key questions and listening carefully to academic and community leaders.

"We talked with every academic dean, key faculty member and opinion leader and asked what their dreams were as academic professionals. What do they want to accomplish for their students? Then, we asked them to talk about Macomb County and tell us their views on how they saw the university's role there."

Next, the Stratus team visited the Southeastern Michigan community, seeking responses from important external partners. These included the president of Macomb County Community College and staff of Macomb University Center (MUC), a multi-institution teaching center opened in 1991 where students can access certain courses and degree programs offered by area colleges.

Still more questions went to business owners, Chamber of Commerce members and political leaders, such as, what kind of WSU programs and help are needed? What do you think students want? What do you think employers need?

The results were gathered and strategic connections were identified between Wayne State, the community and potential educational partners.

### Innovative Solution

The team's research led to an innovative proposal for Wayne State to open three new centers with focused academic themes. One would embrace and expand the already existing MUC and focus on human development. The other two centers, one located in Warren near the GM Technology Center, and the other in the Mount Clemens area near multiple hospitals and medical facilities,



would create exciting opportunities for WSU to grow new programs in technology and health science.

By opening three outreach centers rather than just one, Rinella said the university would maximize its ability to grow its enrollment by bringing courses to students where they live. The degree programs from the university would not only be more convenient but also more affordable.

Multiple centers would also increase benefits for the business community, maximizing the number of areas

directly benefitting from the increased business and prestige that comes from being near a university facility.

"This idea of creating three new centers rather than one is a relatively new idea in higher education," explained Rinella. "Colleges usually open a single center, a kind of beachhead, and basically say to students, 'you come to us'. In contrast, multiple centers can be tailored to the communities, recognizing and addressing the needs of each community in terms of jobs and resources."

### Process of Discovery

The potential for new student programs, enlivened communities and a revived economy in Macomb County has excited both business leaders and WSU academic leaders alike, according to Rinella.

"We encouraged people to form new ideas, and we asked questions to understand their dreams for the community," said Rinella. "As a result of this creative collaborative process, Wayne State University and the Macomb County community now have a road map needed to begin reinventing the future."

**"Higher education is a catalyst for changing the work force and boosting the economy."**



# The State of Utah Focuses on Commissioning to Enhance New Facility Function

With one of the nation's most educated populations, the state of Utah places great value on its institutions of higher learning.

Five years ago, the State's Division of Facilities and Construction Management (DFCM) recognized many of the systems within its highly regarded university facilities were not performing to optimum operating conditions. The solution: commissioning.

"Commissioning at the University of Utah came about due to a gap between construction and design," said Bill Bowen, capital development program director for the DFCM. "We needed an overarching entity to ensure that all elements were working collectively."

According to the National Institute of Building Sciences, the operating costs of commissioned buildings average between eight and 20 percent less than those of non-commissioned buildings.

Maximizing building system efficiency can also create a more comfortable building environment—leading to happier, more productive students and staff.

Fast forward to 2008. While the University had been commissioning its buildings for several years, many new and renovated campus facilities were still not functioning to their full energy efficiency capabilities. They needed someone to help take the commissioning process to a further, more detailed level of review.

That year, the DFCM and University of Utah appointed Heery to provide commissioning for two new buildings: the 188,000 SF David Eccles School of Business replacement and expansion project and the 193,000 SF Sorenson Molecular Biomedical Building, both targeted to achieve LEED Gold.

**"The University brought us in because they wanted more out of the commissioning process."**

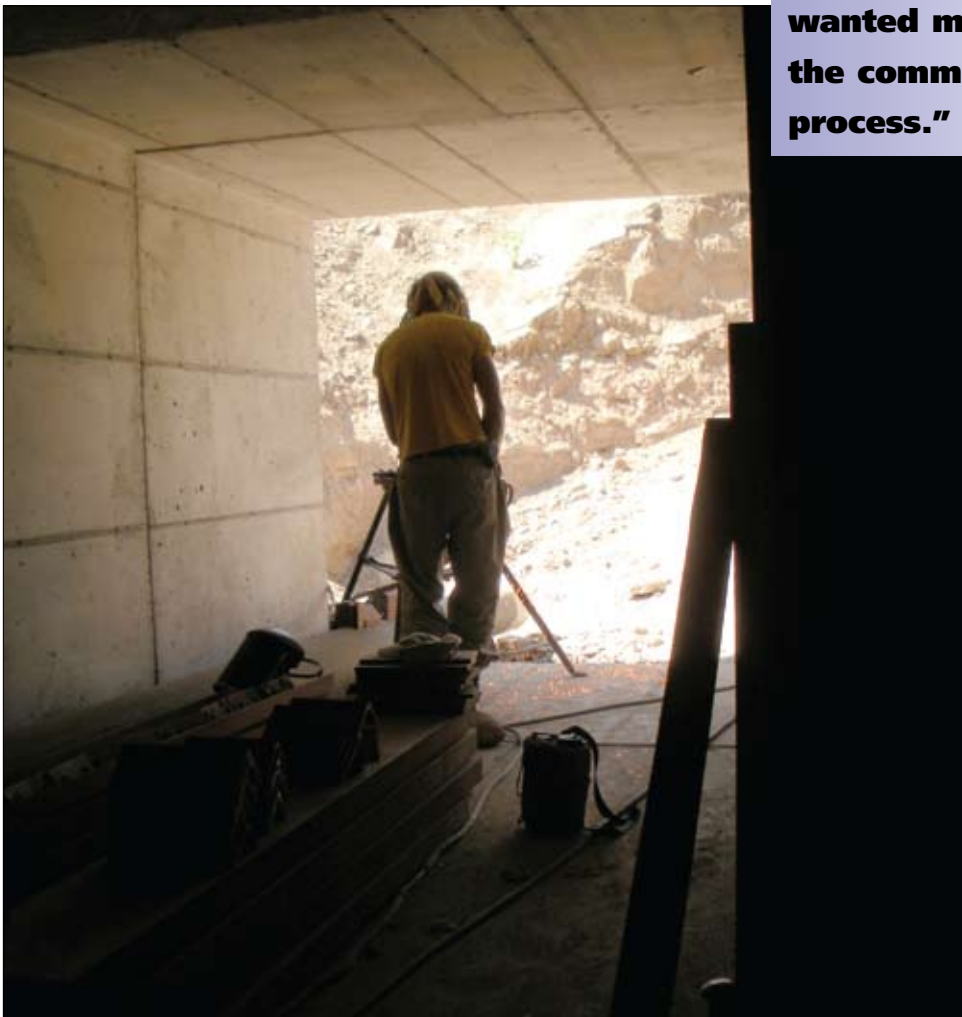
"The University brought us in because they wanted more out of the commissioning process," said Jeffrey Bowick, Heery senior commissioning agent for both projects. "They needed someone to help coordinate the commissioning tasks in the design and construction process as well as serve as liaison for commissioning as it related to the building systems themselves."

To deliver more timely, cost efficient construction, the state of Utah has embraced the design-build at-risk approach for many of its construction projects. While those results have indeed been achieved, Heery found that the potential for contributing to non-validated system performance and non-functioning building systems was inherent to the delivery system.

"Each project is broken into four bid packages, which essentially breaks the team into separate design units," said Bowick. "Often, the first bid package—commonly site work and infrastructure—is bid and construction is started before building design is complete. Consequently, designers of the early packages can't always accurately specify building system interfaces and tie-ins. We quickly determined our role was to bridge communication between the four design units, confirming all team members had enough information to design and construct their piece of the project."

Heery found many problems stemmed from insufficient design details and insufficient building equipment operating sequences that show how each piece operates alone and as part of an integrated system. "One of the benefits of hiring a commissioning agent early in the design process is the ability for the agent to understand the owner's goals for facility performance," Bowen says. "That knowledge not only helps drive design and engineering decisions but helps the commissioning agent test systems later on to verify it functions according to design intent."

The breakdown was a simple lack of communication—designers and engineers weren't sure how much information to include in the early packages. Consequently, there was often not enough information to properly install equipment



in the later packages. Lack of detailed information also made it more difficult for commissioning agents to fully test the system function and performance. Recognizing the simple communication breakdown, Heery is now focused on working closely with the designers, engineers and operations groups, evaluating documentation and managing clarification meetings to confirm that details and sequences are as detailed as required for a successful project.

“A good commissioning agent has to be a good facilitator,” said Bowen. “Early on, Heery asked a wealth of probing questions that impacted how architects and engineers viewed the project and helped them enhance design details. As a result, the owner will benefit from a facility that functions as designed and the ultimate end-user will enjoy a healthier, more comfortable learning environment.”

## Colleges and Universities are Opting to Commission Facilities to Enhance Performance and Energy Efficiency



While pursuing a college degree is about students making an investment in their future, the investment is not completely one-sided. Clearly, students shoulder the bulk of responsibility in motivating themselves to perform to the best of their abilities. Colleges and universities, however, bear the responsibility for investing in and providing quality instruction and facilities conducive to learning.

Of course, creating high performing facilities is no easy task, especially in an economic climate that is forcing colleges and universities to rethink or scale back on capital and operational expenditures. “Today’s building and operating systems are incredibly sophisticated and interrelated,” says Ron Bogue, assistant vice president for facilities and services at the University of Miami, which currently requires new facilities to attain a minimum LEED Silver Certification. The university’s medical school has recently been constructing complicated wet lab space as well as a new central energy plant.

“Given Miami’s intense heat and resultant air conditioning requirements, we’ve been developing a complex energy management system,” Bogue says. “The challenge is that as the systems have become more complex, it’s also become more difficult for management to find staff that understands how these systems operate. As an owner, it’s my job to make sure staff understands building systems and how they’re supposed to work.”

The devil is in the details. “We’ve learned that contractors may or may not follow the architect’s specifications,” Bogue notes. “While we pay architects to do construction administration, commissioning validates that the systems we’ve specified are installed correctly and operate according to design.”

At University of Miami, faulty equipment was discovered and repaired before it could become an issue. At the University of West Georgia, a power shut down/generator test revealed that some motors for roll-up doors had not opened and were not on emergency power, a critical issue that would have delayed approval by the Fire Marshall and thus delayed the project’s completion.

Of course, commissioning is not just about verifying that systems are installed and operating properly. When executed correctly, it can also lead to energy saving opportunities such as those that were realized at University of Miami.

“We carefully studied the sequence of operations that had been developed for the central energy plant’s operations,”

notes Heery International Commissioning Agent Richard Young. “We then started fiddling with the system to identify optimal operating parameters. While the initial goal as designed was to run two pumps quickly, pulling 430kW of power, it was determined that it would be more efficient to run three pumps slowly to satisfy the exact same demand at a power consumption of only 283kW. As a result of this single commissioning effort, the university will save just over \$150,000 per year and more than \$3.5 million over the 25 year lifetime of the plant. Between this and other efforts, the University will clearly see significant long term savings on its electricity bill.”

**“When commissioning is properly executed, reduction in operational costs can be substantial.”**

Such savings are not unique. “When commissioning is properly executed, reduction in operational costs can be substantial,” notes Rick Fedrizzi, founder and CEO of the U.S. Green Building Council. “Commissioning often increases energy efficiency by five to ten percent.”

Bogue believes colleges and universities can benefit from commissioning whether or not they are seeking LEED certification. “Our plant, for example, will run better and more efficiently than initially planned,” Bogue adds. “While commissioning may seem difficult to justify because it will add up front costs, it’s important to look at the implications as they relate to operations and energy efficiency. I believe we’ll see a return on our investment within three to five years.”



# Maryland Terrapins Score a Suite Victory with Stadium Ribbon-Cutting

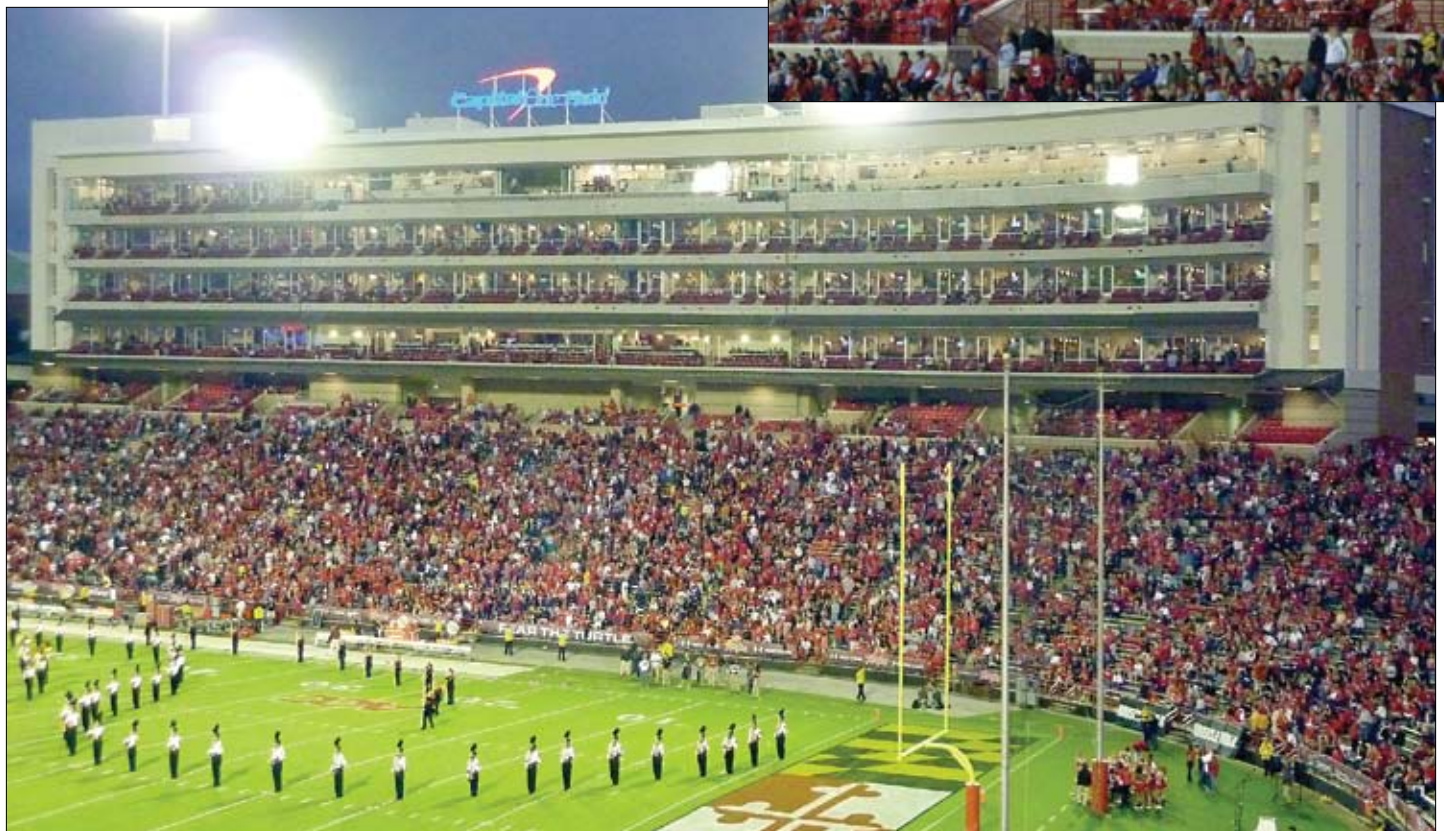
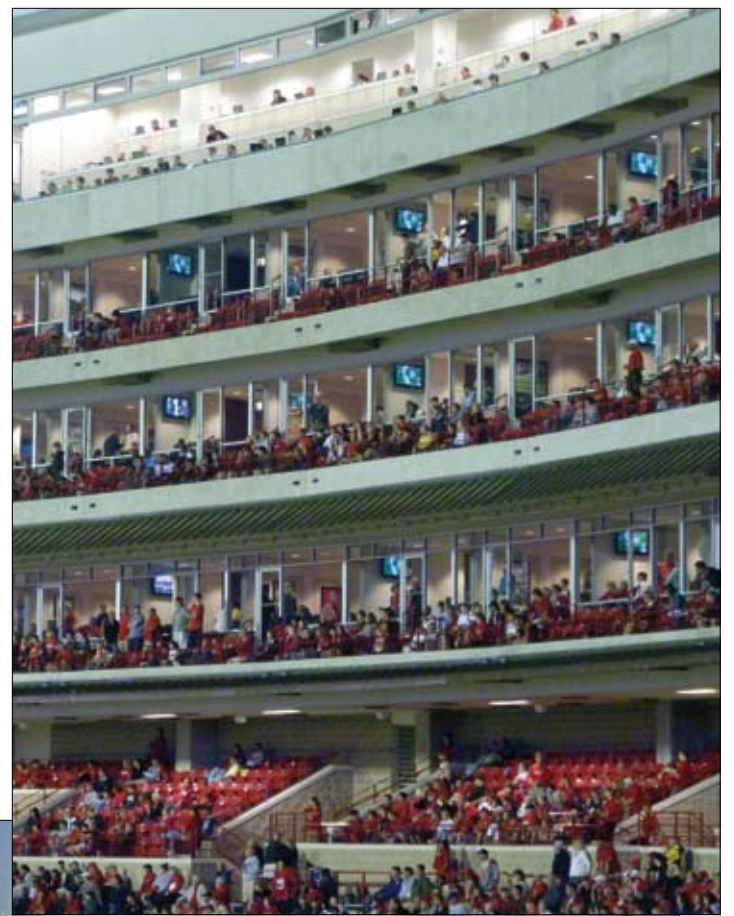
University of Maryland President C.D. (Dan) Mote, Director of Athletics Deborah A. Yow and Head Football Coach Ralph Friedgen were just a few of the dignitaries on hand to celebrate the dedication of the newly upgraded and expanded Tyser Tower at Byrd Stadium on September 10, 2009. At the dedication, Mote said the day was “an important one for recruits, alumni, current players and the coaching staff.”



Heery's Atlanta and Washington, D.C., offices provided the architecture, mechanical, electrical and plumbing engineering, as well as construction administration for the 60,000 SF brick, glass and EIFS addition. It includes 64 suites, a new covered mezzanine with seating for more than 400 patrons, new areas for working media and new booths for radio and television. “We created a very functional layout that provides easy access for guests, as well as great views of the field action,” says Heery Vice President and Director of

Sports Facilities Mike Holleman. “It is a handsome building that works well with the campus’ existing architecture, forming a courtyard with two neighboring alumni facilities. The university will be able to use the 200-guest president’s lounge not only for game day activities, but for year-round entertainment and conference events. The addition not only balances the stadium interior mass of the north with a similar scaled south side addition, but also keeps fan noise inside to create a more intimidating playing environment.”

Not only did the new stadium score points with fans, it scored the attention of the design community as well. Mid-Atlantic Construction Magazine recently awarded the facility the Sports/Recreation Project of the Year in its Best of 2009 Award Program.



## HEERY

www.heery.com. For additional information, please contact Editor at 800/52Heery.

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