

SCHOOL REPORT

"IF ONLY"...

Strategies to Avoid Regrets on Your Next Building Project

"If only..." Those words haunt every difficult project ever undertaken by a school district. "If only we'd known that there would be a serious shortage of masons." "If only we'd known that the Beijing Olympics would mean exorbitant prices for structural steel." "If only we'd known that the teachers wanted tile instead of carpet in the classroom." "If only we'd known that permits would take twelve months, rather than six." "If only we'd hired a design consultant that specialized in renovations rather than new schools." "If only the contractor hadn't defaulted."

The list is endless and disheartening, but what if there were another way of looking at the ever-increasing list of "lessons learned"? What if one could recast that list into a process that would help point out the cliffs, serious "s" turns and dead-ends on the road to delivering a successful project?

In speaking with experts across the United States about how to plan better for projects and about the strategies they've developed to prevent those hard-won lessons from happening again, six primary strategies consistently emerge among these battle tested leaders: (1) G2—Gather the background intelligence; (2) Conduct a market survey; (3) Balance the budget, program and schedule; (4) Write a management plan; (5) Establish a communication chain of command; (6) Select the right design consultants and have a formal meeting to kick off the project.

G2: Gathering Information that Matters

The dozen experts interviewed for this article were unanimous about this first step. Find out who really is calling the shots before going one step further, they advise. It might seem a simple question, but it can yield large insights if you can get clear answers.

"I like to find out exactly how many people and how many agencies and other groups are part of what's happening, because any one of them could potentially have an impact on the budget and schedule of the project," advises Scott Pinkerton, a seasoned Heery executive with more than 30 years in public sector design and construction programs under his belt.

Dennis LaGatta, another 30-year professional who is currently project director for a Montgomery, Alabama, school construction program, believes he must absolutely understand the decision-making process and the culture within which it occurs. "There are strong board controlled organizations and strong superintendent controlled organizations, and you have

an obligation to both parties, but it's important to know which one is controlling the program."

Another important feature of intelligence gathering is to focus on the unwritten expectations. It doesn't matter whether it's a large urban district, a small rural district or a suburban district, our experts tell us there are always hopes and aspirations for the program that are unspoken.

"It's like a detective job," states Ralph Rohwer, a Heery vice president who has spent nearly 30 years exclusively managing school building programs in the northwest. "I ask about their expectations. Sometimes my clients don't know how to articulate what they expect until I start asking questions. One strategy I use is to just start throwing things to them randomly, such as how they feel about flat roofs. Usually I can get them started."

Conduct a Market Survey

A good market survey can help anticipate shortages while there's still time to consider alternatives, say the experts. But, what constitutes a good market survey?

Look for a study that evaluates the competitiveness of the local industry, because the more competition, the better the price. Competitiveness is a subjective measure to some degree, but it can be evaluated objectively by looking at the backlog of work, the status of material prices, the status and trend of the labor market, and the list of big projects about to hit the bidding market.

"I prefer to have a good market analysis in my hands before validating the budget and the schedule because it lets me know the availability of trades and materials and gives me a better sense of their cost," asserts Tony Gaydon, a 40+ year veteran in the design and construction industry and one of Heery's quality control professionals for construction program management. "I know whether or not the market is saturated and under what conditions I will most likely be building."

Of course, Gaydon points out, there are things that can't be foreseen in a market survey, such as the influence that hurricanes or other natural disasters can have on labor and material pricing. "Katrina had a dramatic effect on the prices throughout the Southeast and up into mid-west. There's no way to plan for that. But, because we'd done so much market research, we knew what our options were for mitigating the impact."

Gaydon points to the dramatic rise in copper prices last year – up 65 percent over the previous year – that can cause

continued on page 2

INSIDE

The City Schools of Decatur Tackles Its Eclectic High School Campus

Coastal Washington School Rebuilds After Devastating Fire

All Systems Are Go After Commissioning Effort

Sustainable Community Becomes Home to Denver's First Sustainable Public School

Preparing for a Population Boom

Building a Center for Early Learning

Charter-Heery Team Helps MacArthur Gym Rise from the Demolition Rubble

In The Community

"IF ONLY"...

continued from front page

cost issues on almost any project, as well as the localized price spikes that can hit particular areas. "In Boston, there's a lot of brick involved, so I know I should have a good brick supplier who'll hold to his or her number if I'm planning to use it."

Balance Budget, Schedule and Program

Almost any seasoned manager will say this: don't proceed into any kind of design or design planning until the budget, schedule and program (also known as scope) are in balance. The situation does not improve as the project moves along—in fact, it gets worse.

"I cannot stress enough how important it is to make sure that everyone understands what you're buying going forward, because it's the only way to identify scope creep," emphasizes John May, who has been in charge of school construction programs throughout Ohio and Texas. "I like to break the entire budget into line items and detail exactly where the money is going. Technology? Legal Fees? Financial Advisor? Furniture? Moving Costs? It's all listed."

According to Rob Chomiak, who has worked on schools programs from New Jersey to Texas, districts should pay close attention to understanding contingencies during the budgeting process. "It is important to know that there are different types of contingencies—design, in-progress, owner—and to understand how they work and who controls them."

May also warns his clients to beware of people who want to claim the interest earnings on bond money. "If the school district wants to use the interest earnings for extras and added value, that's their call, but designing to an inflated budget is a recipe for trouble."

Scott Pinkerton specifically recommends asking how many district staff and how many district departments will be charging to the project in an effort to itemize soft cost line items to the highest degree possible. His rule of thumb is that with government projects, the soft costs range from 20-35 percent. If it shows up lower than that, it sends up a flag for him. "I know if it's too low, something's not in there."

Worcester cafeteria kitchen



The program itself can be a challenge. Pinkerton also points out that the program for a project is frequently incomplete because various user groups haven't been involved. If that's the case, he encourages his clients to meet with the people using the building and confirm the program. "You find things out that way. The maintenance staff may have very strong opinions about how they want the facility to

operate from a maintenance standpoint, while the food service staff has different concerns. It's best to know all of that before anything gets drawn."

On the schedule side, May, a veteran of several multi-phase renovation projects, points out that most schedules fail to account for the need for swing space and the costs associated with it. "You might need early packages to address both the school's need for space to continue instruction and the contractor's need to keep the construction on as tight a timeline as possible."

And, here's another scheduling tip from Ohio-based May: In colder and snowier climates, it is better to schedule bond issues for late winter/early spring to allow the start of construction to occur as soon as the ground thaws, since the design process would normally take 12 months to complete.

Write a Management Plan

According to the experts consulted for this article, there is no substitute for a formal, written management plan. It is common for people involved in projects to think that the project will get better as it proceeds and not to focus on getting all of the processes and systems in order. A formal management plan lays out the client's expectations for the project, including quality issues, occupancy requirements, cost, schedule, phasing and critical function dates. It anticipates the constraints and documents options for working around them.

"In the project launching phase, as I'm working on the Management Plan and the market survey, I literally build the building in my head," says Tony Gaydon. "I think through every aspect of how the materials will get to the site, what the materials are, what's going on in the community that might disrupt traffic or cause a labor or material shortage, among other things."

"My motto is 'Let's make it work now, when it's just on paper, before any design starts,'" asserts David Waggoner, who has been responsible for putting in place nearly \$2 billion in schools over the past 25 years. "For me, that's what the cost model is all about - we build the project in our heads with the sketchiest information in order to identify all of the unknowns that we can. We ask a lot of questions at this stage."

There are many ways, for example, to accomplish a given schedule. Traditional design/bid/build is the longest delivery model there is, and many school districts are now using other methods, such as construction management at-risk, design build and job order contracting. It is important to state specifically in the management plan what the acquisition strategy for the project is going to be and why.

"My main piece of advice during the development of the management plan is to ask a lot of questions," offers Waggoner. "The decisions made early are the most critical."

Ralph Rohwer agrees: "The only way that I can list all of the tasks involved from the beginning until move-in is to ask questions. Then, I can organize the tasks in the most logical way possible."

Identifying constraints is a key part of the management plan because it dictates the critical date schedule for getting the project done. "I visit every agency that has jurisdiction over the project to find out the time they need for review," confirms Rohwer. "That has to be built into the schedule."

"Seven months is not an unusual time for some agencies to review projects in California," points out Scott Pinkerton. "That better be accounted for in the schedule."

"I want to understand the operational schedule of the campus, such as traffic flow, when the band needs the parking lot to practice, when classes change," explains Charles DeVoe, who as head of Heery's Charter Builders group handles \$350 million in K-12 school construction projects per year. "We



schedule around the school’s calendar year, so we get an early copy of the school schedule and identify the off times that we can use for critical construction activities.”

DeVoe also likes to know the board schedule so that board financial approvals can be synced with the construction schedule. “It’s up to us to adapt, not them to change,” he states.

Establish a Communication Chain of Command

While technically a part of the management plan, our experts think having a clear understanding of the communication chain of command and authority is so important that it requires special attention. This goes to the heart of “who needs to know what when,” but also simpler matters such as which parties are copied on which pieces of correspondence.

There’s no denying it: costs, schedules, correspondence, and other project documentation must be organized so that everyone involved in the project can see the information they want and need to see. Each project and owner is different regarding his or her type and frequency preferences for receiving information. And, the best way to find out who wants what is to ask each person. Then, according to our experts, develop a hierarchy of reports to reflect these preferences.

“A big part of managing any large program is presenting simple, accurate and timely information that’s readily available so that the right decisions can be made,” points out Rob Chomiak.

From a communications standpoint, however, someone in the district needs to serve as the point of contact for consultants, contractors and subcontractors. “Reporting to a committee doesn’t work, although many districts would prefer it,” states Dennis LaGatta. “You end up reporting to the board member on the committee in reality.”

Projects involve thousands of minor and major decisions on the part of an owner and that means that one person really needs to be on point, explained the school specialists consulted for this story.

All of the experts agreed that simply asking who needs what information and how frequently they need it can be

tantamount to walking into a minefield, but that it is one of the most fundamental and necessary questions that must be answered. “It gets interesting when one person in an organization decides that another person in the organization doesn’t need or require the information that they’ve asked to receive,” laughs one of our specialists. “That’s politics.”

“We do find ourselves in the ‘shuttle diplomat’ role helping resolve issues that have been festering for years,” puts David Waggoner, judiciously.

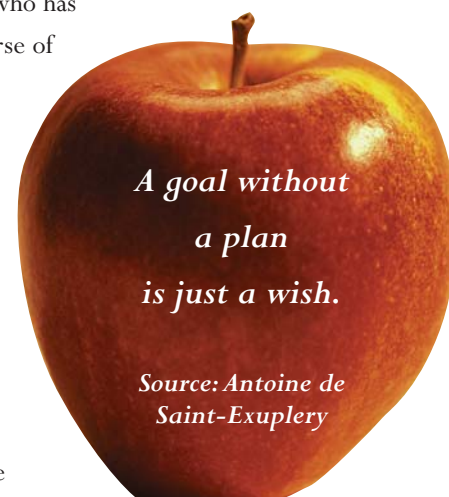
Other aspects of the communication chain of command include keeping everyone on the team up to speed. “Our clients want us to build a team early on and one of the best tools for that is to open up lines of communication among all members of the team. I’d rather see something debated openly in meetings than letters flying back and forth,” explains Ralph Rohwer.

Design Consultant Selection and the Pre-Design Project Analysis

Often, when project launching is discussed, it is almost entirely a discussion about pre-design project analysis meetings. “First you have to make sure you have the right team at the table,” explains Heery’s Daryl Bailes, who has completed hundreds of school projects in the course of his career. “It’s important to know architects and their capabilities. Whose expertise is really in renovation and who does better on new projects? How can we weight the selection criteria for architects to get the right match of designer and project?”

Bailes does his part to make the selection process objective and numbers-based, rather than based on friendships. Criteria include: staff size, credentials and average years of experience for the principals and support staff, direct public K-12 experience on similar size projects and other relevant experience, such as private school assignments.

“I also take a hard look at the consultants, especially in engineering,” says Bailes. “And, of course, I check references. I ask about the quality of the design and documentation, the



*A goal without
a plan
is just a wish.*

*Source: Antoine de
Saint-Exupery*

continued on page 4

"IF ONLY"...

continued from page 3



Long Branch High School

quality of the construction administration, the responsiveness to communications, such as RFIs, and their ability to adhere to the budget and schedule.”

Once the design team is selected, our experts enthusiastically support having a formal pre-design project analysis.

“Many times our clients will want to jump into programming rather than doing the brainstorming involved in the session,” points out Bob Monser, who has worked on school programs in New Jersey and Massachusetts. “I have seen these sessions eliminate pre-conceived notions and develop into concepts with greater efficiencies than the clients thought possible. It really can help you build a better mousetrap.”

The agenda for a pre-design project analysis hasn't changed much over the forty years that the specialists have

been having these kick-off sessions. “We review all of the design standards and ed specs, and perhaps more important, why they are the way they are,” states Bailes. “I want the architect on the same page with the rest of us.”

Tony Gaydon and Dennis LaGatta both point out that having all of the consultants (engineering, food service, etc.) at the table helps get everyone on the same page. “We find that if the architect doesn't bring the consultants, the architect will communicate only 1/3 of what's important about the schedule and the cost, among other critical items. We want everyone at the table for the pre-design project analysis.”

Adds Charter/Heery's Charles DeVoe, who has spent most of his career providing at-risk construction services to clients: “Times are changing. Most of the time we're at the table with the architect at the pre-design meetings before a line's been drawn. We can point out where the cost or schedule busts are before anything happens.”

Plan Now or Pay for It Later

“Plan the work, get buy-in on the plan and work the plan,” states one of our experts.

“Everything is intertwined,” says another.

“If you don't set it up properly from the beginning, you will be dodging bullets,” explains a third.

“Do it early and take the time to do it the right way,” asserts another specialist.

With nearly 300 years of school building experience among them, our experts are consistently insistent about the importance of proper planning and information gathering during the early part of launching a building program. Their lessons have been taught on the tough field of projects that haven't enjoyed the most careful of planning and launch. Unanimously, they agree that doing it right the first time is easier, less stressful and produces fewer heart-stopping moments for all concerned.



Heery International has won the prestigious 2006 Grand Prize for Project Management from *School Planning & Management's* Managing Excellence Awards Program for its work on Worcester Technical High School,

Worcester, Mass. The \$90 million school, which opened in fall 2006, was cited as “an outstanding example of

what can happen when all team members remain focused on creating a successful project.” Worcester, Mass., is the home of the trade school movement in the United States, having opened the country's first trade school in 1908. Worcester Technical High School is a 400,000 square foot technology-rich school that offers 24 separate tracks of study organized into four 400-student academies: construction, manufacturing, health and business. In addition to the students that the school serves during the day, it can also accommodate 3000 students for year-round evening and weekend training. This is the largest public works project in the City of Worcester's history. *The three-year-old "Managing Excellence, Delivering Success" awards program showcases the methods and procedures used to control time, cost and quality in order to provide education environments that are safe, secure and appropriate. Heery was also the recipient of the grand prize in the first Managing Excellence awards program for its work with Seattle Public Schools.*

SMALL, BUT MIGHTY:

The City Schools of Decatur Tackles Its Eclectic High School Campus

The City of Decatur is located in four square miles of DeKalb County, Ga., essentially surrounded by the ever-expanding Atlanta metropolis. The community of 18,000 people is home to Agnes Scott College and Columbia Theological Seminary and located less than a mile from Emory University and the Centers for Disease Control, and more than a third of Decatur's citizens hold advanced degrees. Yet, the district's most recent new school building project was more than forty years ago and its last school without air conditioning finally achieved this milestone in 2005.

When Dr. Phyllis Edwards, the City Schools of Decatur superintendent, joined the district in 2003, the Board of Education asked her to develop a comprehensive strategic plan for the 2500-student district. As an extension of her plan to become one of the nation's top ten community school districts, Dr. Edwards requested that district staff work with professional designers to revise an earlier \$69 million master plan to improve the high school campus by adjusting priorities to make it affordable and in keeping with the community's commitments and values. City Schools of Decatur selected Heery to assist with the master planning revision.

"Even though the school didn't have the right facilities and the students had to practice in the hallway, the high school faculty was able to develop an award-winning drama program," explains Dr. Edwards. "As a lifelong educator, I had to ask – what if the facilities weren't getting in the way and actually supported the educational process?"

A Study in Contrasts

Located in downtown Decatur, Ga., within walking distance of the DeKalb County courthouse and the city square, Decatur High School is the home school for every public high school senior in the City Schools of Decatur. The entire community turns out for the annual homecoming parade and the school has been the centerpiece of the community for generations.

That being said, the campus itself is an interesting amalgam of architectural styles and construction techniques – some good and some bad – spanning the last five decades.

"The central gymnasium is the oldest building on the campus. It was built in the late 1930s as a WPA [Works Progress Administration] project and was expanded in the 1950s," explains Scott Dreas, project director for Heery International and part of the planning team for the City Schools of Decatur master plan for the high school. "The gym can no longer be used for games – it doesn't meet current high school facility athletic regulations, so all games are played in the community recreation center down the street – and serves as a practice gym for both the middle school and the high school. The old gym has only one court and cannot accommodate all seven basketball teams plus the two volleyball teams."

Other buildings on the campus include the classroom building, built in the mid 1960s, and vocational wings, which were added in the early 1970s. Despite the age of the facilities, Decatur High School is home to several award-winning programs, including its Journalism department's nationally award-winning publication, *Carpe Diem*, and a championship mock trial team.

"Even the high school's science laboratories are more than 40 years old," notes Dr. Edwards. "If we want our students to compete nationally and internationally, we have to pay attention to this type of thing."

Send Me In, Coach

Sometimes an element of luck comes into play when planning school facilities, and in the case of Decatur High

School, that luck came in the form of a new coach. Carter Wilson, who joined the faculty of Decatur High School as Athletic Director in 2000, was a former DHS student who had gone on to play college basketball and then serve as basketball coach with Georgia State University. When he joined the planning team to assess the Decatur High School facilities, he brought his unique perspective to the situation.



One of the key elements that Coach Wilson pointed out involved the school system's middle school, which had a small circa 1970 gym that was entirely inadequate. As a result, middle school students regularly crossed the railroad tracks that bi-sect the city to use the high school's gymnasium or the city's

recreation center. Besides the general safety issues involved in having middle schoolers crossing railroad tracks, the situation didn't serve the students in terms of either their athletic or their academic pursuits.

As a result of Coach Wilson's involvement, the team began to re-evaluate priorities for addressing the most pressing facility concerns.

A Workable Plan

The resulting \$28.1 million plan scales back considerably from its \$69 million predecessor, yet has plenty of features:

- **Auditorium:** a 500-seat auditorium with instructional support space for the arts and an enclosed pedestrian bridge to the existing high school;
- **Gymnasium:** a 2000-seat gymnasium with two practice courts and one competition court, along with related locker rooms and instructional support space for physical education and athletics;
- **Science Laboratories:** renovated and updated high school science laboratories;
- **Middle School Gymnasium:** two practice courts and one competition court with spectator seating, locker rooms and instructional support space;
- **Green Space & Parking:** relocation of the existing high school parking lot to create green space behind the high school.

The existing gymnasium will be demolished to make way for the new auditorium, while the City Schools of Decatur's maintenance department will be co-located with the City of Decatur's public works department to make room for the infrastructure improvements.

"This is a plan that can be implemented," explains Dr. Edwards. "Before our plans were simply beyond our means. These improvements are reasonable and in keeping with our community's priorities."

In September 2006, they approved a \$16.5 million bond issue. The district expects to fund the balance of the program through a special purpose sales tax funding mechanism that is used throughout the state of Georgia.



Decatur High School

COASTAL WASHINGTON SCHOOL

Rebuilds After Devastating Fire

Aberdeen, Wash. residents could do nothing but watch in horror when a sizeable chunk of the rural seaport town's history went up in flames on June 7, 2002. That "chunk," known as the J.M. Weatherwax Building, was the centerpiece of the town's high school campus. It had been set on fire that night by two students.

Generations of alumni mourned the loss of the 93-year-old building that had been erected during Teddy Roosevelt's final year in office. While no students were injured, the town lost the campus's primary 72,000 square foot structure, which formerly housed 20 classrooms, administrative offices, library, wrestling room, and student lockers. It also lost historic artifacts and records dating back to 1909.

The question that immediately arose was where to place students until a new building could be erected. Since the campus consisted of six additional facilities, officials decided to work with what they had, even using an old church to create additional classroom space.

There were two schools of thought concerning where to build the new structure. "One option was to rebuild in the shell of the former structure," says Aberdeen Superintendent Martin Kay. "We also had an opportunity to buy a 100-acre site about a mile away. Although it would create additional busing needs, the initial bond called for the new facility to be constructed on this 100-acre site." Voters, however, weren't interested in the new site. Only 35% approved the initial bond. The rejection served as the impetus for a new plan. More than two thirds of the voters approved a second bond that called for the school to be built on the original site.

Of course, voter challenges were minor compared to site and construction challenges. The site, an old riverbed, presented numerous challenges. "I have described the soil on this site as very pudding-like," offers Heery International

Construction Manager Steve Nicholas. "We had to bring in two feet of rock because the soil wouldn't support the heavy equipment."

Additionally, the site elevation was very low, almost at river height. After doing borings, the team discovered the area had once been struck by a tsunami. "Given the area's heavy annual rainfall," Nicholas adds, "we had to be certain neither the structure nor mechanical systems could be compromised."

The construction team's solution comprised several elements. "We knew we had to raise the building above the 100-year flood plain," Nicholas notes. Initially the team thought about preloading the site with soil. The problem was that no engineer could tell over time how much the soil would settle. "Instead, we placed the entire foundation on pilings in addition to creating a 43,000 square foot crawl space. If a horrific storm hits, we anticipate water flowing into the crawl space, but are certain the working part of the facility will remain dry and safe." Although the foundations added nearly \$4 million to the project's overall cost, Nicholas is confident the additional funds were well spent.

Shoring up the foundation was no less integral to the project's success than shoring up the new building's envelope. "We get driving rains in this part of Washington," Nicholas says. "Being on the coast, it's not uncommon to see 60 mile per hour winds. Sometimes they can gust up to 80 or 90 miles per hour. We hired one of the best envelope specialists in the state to prevent water from getting inside the building's cladding."

A tight budget presented yet another obstacle. "Initially we were negotiating on behalf of Aberdeen to create a guaranteed maximum price," Nicholas says. "Unfortunately, we bid the project during the hyper-escalation of materials that took place between 2003 and 2004. We also were facing above average costs because of our remote location. As hard as we tried, we simply couldn't negotiate a price that was within the owner's budget or the time constraints associated with state matched funds the school needed if they were to appropriately fund the project." Knowing there were deadlines that had to be met, Heery moved from GC/CM to low bid.

The schedule continues to be met. "The building is almost completely enclosed now just in time for winter," Nicholas notes. Although the school lost a 72,000 square foot building, it will gain a 176,400 square foot facility and a 26,000 square foot gymnasium when the project is completed in the fall. While Nicholas knows it's a shame the old building was lost, he is confident that old traditions will live on in the new facility that will undoubtedly meet student needs well into the future.

Eric Hensley - Aberdeen, WA 2002



Aberdeen

ALL SYSTEMS ARE GO

After Commissioning Effort



When it comes to construction projects, looks aren't everything. Without question, owners hope their building is attractive to the eye. They also hope their facility performs as expected. The challenge faced by owners is determining whether they actually received what they requested. Was the equipment specified during design, for example, the same equipment installed? Was it installed properly? Are system values set to meet specific facility requirements?

While it adds slightly to overall costs, Heery believes that commissioning can save an owner money in the long run. One school district recently discovered how much time and money they could save through commissioning.

When a former department of energy employee took the helm as the utilities coordinator for physical plant operations for a school district, most of the schools in the bond construction program had been completed. He recognized that many of the recently completed schools had performance issues and hoped to prevent those same issues in future construction projects. A new construction project provided an opportunity to practice prevention.

Although the project had already gone out for bid, the utilities coordinator was able to add commissioning into the construction mix. "Commissioning the new school was something of a revelation for me and my administrators," he says. "Not only did Heery shed light on some of the common issues we inherited from our other buildings, they also helped us understand our school better."

Shortly into their analysis, the Heery team recognized that a number of design and deliverable deficiencies existed. The team's primary goal was to discover any shortcomings and confirm that the proper steps were taken to maximize the building's overall performance.

"One of the early issues we discovered was that the mechanical engineer and architect hadn't coordinated their drawings effectively," offers Heery Commissioning Agent Troy Kunas. Although most of the earlier projects were similar in design, this project had a unique wood framed design to fit within the context of an older neighborhood. Part of the design element called for the construction of wooden ceiling rafters. "This design presented a problem in the mechanical room," Kunas says. "Organic materials cannot be used near HVAC air systems. The presence of organic materials can create mold and a host of other problems." The solution was to sheetrock the

mechanical room and re-route the return air ducts.

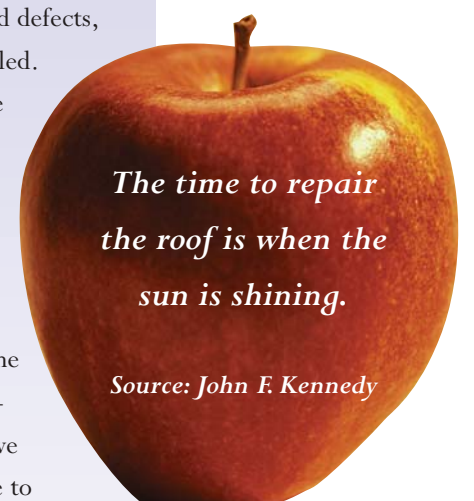
The HVAC system was a challenge in itself. "We identified numerous issues in the HVAC plant operations during functional performance testing," Kunas notes. "The engineer of record had failed to identify significant design and performance flaws. We held the responsible parties accountable on behalf of the school district."

"Not only did Heery make sure the repair work was done," the utility coordinator adds, "they also re-tested the system afterwards to verify its integrity."

One of the team's more frightening discoveries was the fact that approximately 35% of the fire/smoke damper indicators didn't operate correctly. "We had gone in to test the systems before a fire marshal visit," Kunas says. "Although this is not typically a commissioning issue, we had seen construction coming together and had concerns." Not only did operational failure represent a major life safety threat, but it also represented a threat to the HVAC system's long-term operations. Kunas is also clear that the building's opening would have been delayed had the fire marshal discovered the non-working dampers.

A host of other problems was outlined. "There were discrepancies between lighting electrical drawings and actual installation of equipment," Kunas cites. "Not only did we discover that the direct exchange air conditioners had defects, we also discovered they had been incorrectly assembled. There were gaping holes in some of the seams where the pieces hadn't been correctly matched up. For every problem we discovered, we were able to work with the various vendors to get each issue resolved to the school's satisfaction."

The utilities coordinator is pleased now that construction is complete and students are roaming the new school's hallways. "I have no doubt that commissioning has helped us and will continue to help us save time and money here," he states. "First, we were able to identify a lot of problems early, prior to warranty expiration. I believe my team and I know now what we're dealing with and where our potential trouble spots lie. Thanks to the training Heery provided, we also know how to proceed in maintaining this facility for the future. Based on the benefits we've seen, my goal is to make commissioning standard operating procedure on future construction projects."



*The time to repair
the roof is when the
sun is shining.*

Source: John F. Kennedy

SUSTAINABLE COMMUNITY

Becomes Home to Denver's First Sustainable Public School

Times have certainly changed at Stapleton, a live, work and play neighborhood located just minutes from downtown Denver, Colo. Ten years ago, the 4,700-acre site, which once housed Denver's airport, was littered with abandoned runways. Thanks to the efforts of committed citizens and developers that wanted to reclaim and recycle urban land, Stapleton is now one of the nation's largest urban developments, recognized by organizations across the country for its commitment to sustainability.

Just as the neighborhood set a new standard for urban developments, Mike Langley wanted the neighborhood's new K-8 school to set a new standard for Denver Public Schools (DPS). "Instead of having to use school bond funds for this facility, we received funding from the Denver Urban Renewal Agency, the agency that helped fund the neighborhood," notes Langley, DPS' former executive director of facilities management. "Our goal was for the William R. Roberts School to be the prototype for future DPS schools."

Following a "Green Guideline" created by the Stapleton Redevelopment Foundation, City and County of Denver, and a Citizens Advisory Board, Heery International, working in a joint venture with Empire Construction and AMI Mechanical, assessed which features seemed most feasible for the new school. "We spent a lot of time evaluating first costs versus long term benefits," notes Heery International Project Manager Tom Blahak.

Although the team initially anticipated a cost of \$1.2 million for the GeoExchange heating and cooling system, the actual cost was several hundred thousand less. "After we tested the thermal conductivity of the soil, we knew this site was perfect for a geothermal heating/cooling system," Blahak notes. "This is the first total building geothermal system used at a DPS facility." The athletic fields proved an ideal location for placing the 234 bore holes the system required. Each classroom has an individual heat pump and thermostat for maximum classroom comfort.

"Based on our research," Langley says, "we believe we'll save between \$30,000 and \$40,000 per year on our utility bills." Although the school has only been open since this fall, the construction team expects to see a reduction in maintenance costs as well.

"With no chillers or boilers, there will be fewer mechanical pieces requiring maintenance and replacement," Blahak adds.

Daylighting is another sustainable feature that has been used extensively in the corridors and classrooms. "The sun can get rather bright on the school's south facing classes," Blahak says. "Instead of letting that glare heat the classroom and make it uncomfortable, we've installed reflective diffusers in each room to spread the natural daylight across the entire classroom."

Each classroom offers dual intensity lighting. "On a sunny day, there's sometimes no need for teachers to turn the lights on," Blahak adds. "This should help reduce our utility costs as well as the costs associated with replacing light bulbs."

A reflective ceiling in the corridor brings in the natural daylight and diffuses it. Depending on the sun's presence, lights in the corridor dim automatically thanks to installation of an Integrated Building Automated System. "In addition to the fact that the heating and cooling have early morning start-ups and late day shut-downs," Blahak says, "we can program the system for occupied versus unoccupied modes." Both the lighting and HVAC systems can be accessed remotely through a web-based program. "What's great is that if someone accidentally leaves a light on, it will turn off automatically at day's end.

Since this is the district's first major sustainable effort, the facilities team will revisit the project later in the year to determine how it is faring compared to more traditional new facilities "We need to determine which features make sense and which don't," Blahak says. "We also need to nail down the savings on a monthly and yearly basis. In order to gain approval for other sustainable facilities, we need to show supporting evidence regarding first costs as well as rates of return.

While the district is eager for the sustainable elements to result in cost savings, the district also wants teachers to use the sustainable elements as teaching tools. "We met with teachers to explain the sustainable elements before school opened," Blahak notes. "Some of the teachers were very excited. We hope that enthusiasm will be converted into a learning experience for the students and the community."



Stapleton

PREPARING FOR A POPULATION BOOM

The Socorro Independent School District (Socorro ISD) is located near Fort Bliss in El Paso, Texas – a town whose 500,000-person population is set to explode in the next decade as the U.S. government implements BRAC, its base realignment and closure program. BRAC will relocate American troops based in Europe back to the United States. One of the bases slated to receive those troops is Fort Bliss.

Research shows that every individual soldier who moves into an area brings in six to eight additional people, including family and support personnel. Fort Bliss will grow by 25,000 – 40,000 troops; the city of El Paso, then, will grow by at least one third in five to ten years. Not surprisingly, the influx of new residents will also draw in new businesses and industries, especially high-tech industries.

Socorro ISD retained Heery to conduct comprehensive facilities condition surveys and long-range master planning for 23 of the school district's 37 facilities. The facilities include 13 elementary schools, four middle schools, one pre-K through eighth-grade school, three high schools (including one encompassing 500,000 square feet on a single story), one alternative high school and an aquatic center with water slides and other park-like features. In total, the assessment covers 2.8 million square feet.

Despite a history that dates back to the 1800s, buildings in Socorro ISD are quite new. The average age of the district's facilities is 15 years; the oldest buildings are only around 30 years old. "We're a fast-growing district, one of the fastest in the state of Texas," Tom Eyeington, Socorro's assistant superintendent for operational services, reports. The district



currently includes over 38,000 students, about 1,000 of whom are from military families. "That number will increase, because our district is situated close to the base," Eyeington predicts. "Affordable housing and new schools are going up in this area. It will be very attractive to military families who choose to live off base."

Heery's assessment is being conducted concurrently with a demographics study, which will help shape the ten-year master plan for the school district. "If 20,000 soldiers come in, forty percent will live off base," Eyeington explains. "We have projected for anywhere from ten percent to one hundred percent of them living in our district."

Heery's assessment began in mid-August and is scheduled for completion in early 2007. The assessment will help the district determine facilities needs over the next 10 years.

"Our schools are on the borderline of needing improvement, with many of our systems reaching the end of their warranty period," Eyeington says. "Now we will have a document that will allow us to plan for preventive and deferred maintenance. We're excited to see what we can do based on this assessment."

Building a Center for Early Learning

When Catalina Foothills School District opens its new Early Childhood Center in the summer of 2007, the state-of-the-art center will offer a cutting edge curriculum for 126 two to five year olds in six classrooms. This project is just one of over 50 engagements Heery has undertaken with Catalina Foothills schools, which is located in the foothills of the Santa Catalina Mountains on Tucson, Arizona's north side. Over the last twenty years, the district has grown from a sparsely populated desert haven for affluent retirees to a thriving suburban community that values education, expects excellence and has a tradition of strong support for their schools.

"We're excited about this project for a lot of reasons," enthuses Don Sowell, Heery's project director for Catalina Foothills. "The Catalina Foothills School District has been a long-time client; we sincerely enjoy working with them. They're a huge asset to our community. Our offices are just a few minutes away from their headquarters, so most of our employees live in the district. It feels like home working with Catalina Foothills School District because they're in our own neighborhood."

Along with the classrooms, the center will include staff workrooms for use by the 20-25 staff members who work in the center, a staff lounge, office space for the school's director and special education teachers, and a 53-space parking lot. Heery is providing construction management services at a guaranteed maximum price of \$4.6 million.

The school district is unique in its forward-thinking. "These are state-of-the-art schools, with a cutting-edge curriculum. It's rewarding to be part of a progressive organization that's always thinking about new and better ways of educating children," Sowell says. "The Early Childhood Center represents the district's commitment to get young children involved in learning. We're not just providing a daycare center; Catalina Foothills Schools want to teach young children to learn, and in an organized way, which will help these children to succeed later in life. Early learning is a key to long-term success – in both school and life."

Terry Downey, Associate Superintendent of Catalina Foothills Schools, likes the involvement of the children in the design and construction process, "Heery brings [to the project] a real understanding and appreciation for what we want to do with schools, not only to keep children safe, but also to take full advantage of learning opportunities. At the groundbreaking for the center a couple of weeks ago, for example, Heery had hard hats and shovels for the children. That really helped the children feel connected to the site."

The schedule for completing the project is aggressive. Construction began in October 2006; the center must be complete and open for business by August 2007. "We have nine months to do this, so we have to plan and pursue progress aggressively every single day of the schedule," Sowell affirms. Downey is confident that Heery can do the job. "We've had experience with Heery before, so we know we can trust them to meet their responsibilities and to be on time, which is important when you're a school! We know we can count on them," she says.

Sowell aims to meet and perhaps even exceed the school district's high standards. "Our job is not only to meet the schedule and budget, but also to deliver superior quality," Sowell notes. "We're building this for our community's young students and teachers. This project is very important to the community. We're proud of this opportunity, and we want to earn that recognition."

"We tend to take these kinds of challenges very personally," Sowell concludes. "It's a matter of pride to us to do this the best way it can be done. That's our commitment to our client."



CHARTER-HEERY TEAM

Helps MacArthur Gym Rise from the Demolition Rubble

Small projects can be deceiving. No one knows that better than Charter Builders, a Heery International company. The point was recently driven home during a major construction project for the Irving Independent School District (Irving ISD) located in the Dallas/Fort Worth area.

“One of the projects we were working on for Irving ISD was a \$6 million renovation at MacArthur High School,” says Charter-Heery Vice President Aaron Scates. A small portion of the project’s scope included replacing old panels in the school’s uniquely designed competition gym. “The gym,” explains Irving ISD Facilities Director Kelly Horn, “was one of only five hyperbolic paraboloid structures in the country and was built with a thin concrete roof shell system and four columns to support the concrete’s massive weight.”

Replacing the gym panels was to be little more than a cosmetic job. Within a few months, however, the new panels began buckling. Charter-Heery Project Manager Mike Parkos immediately enacted a change order to determine the cause. “We had a structural engineer put devices on the columns to measure whether they were stable or moving,” Parkos says. “After exposing the interiors of the cables we discovered some cables were broken and others were beginning to fail. The cables provided the tension that kept the roof in place.”

Given the structure’s unique design, Parkos went online to research repair options. What he discovered sent shivers down his spine. “I googled hyperbolic paraboloids and found a picture of a similarly designed Florida school building that caved in one night. We certainly didn’t want that happening at MacArthur. While there may have been some repair options, we had to question whether any company would be safe making those repairs.”

Irving ISD, the engineers and Charter-Heery agreed that demolition was the most sensible solution given the potential safety threat. Although equipment and supplies remained in the facility, the gym and all its contents were condemned, off limits to staff and students. What was left was lost.

Of course, the gym’s location presented the greatest challenge. It adjoined one school corridor and was located within 20 feet of two other school structures. “Because we had students and buildings surrounding us, we knew we had to control the demolition,” Scates offers. “There could be no mistakes.”

Recognizing the school’s close proximity to surrounding homes, Charter-Heery sent a note to neighbors, alerting them about the upcoming demolition. “We let them know we’d be happy to film their homes for no charge and provide them with a video in case of post-demolition damage,” Parkos says. To minimize and hopefully eliminate the possibility of neighborhood damage, the team hired independent consultants to place seismographs and monitor the event.

“We scheduled demolition over winter break,” Parkos cites. “The team tied cables to all columns to ensure that the walls fell inward, not outward.” “On the twenty third time the wrecking ball hit, that building just collapsed,” Horn interjects. Thanks to a concerted team effort, much of the debris was gone by the time students came back.

With the compromised facility gone, the team could focus on erecting a new structure. “Given the damage to the old facility, we had to demolish it before a new one was designed,” notes Charter-Heery Project Engineer Scott German. “We took the building down in between December ‘04 and February ‘05. We started construction on the new gym in late spring ‘05.”

Stabilizing the soil was the first order of business for the new gym. “This area is known for having highly expansive clay in the soil,” Horn notes. “We decided to dig five feet below the existing foundation and replace the soil with engineered fill that was further stabilized with electrochemical injection.” “It took three weeks and made a horrible mess,” German notes, “but we’re certain the new facility has a more adequate foundation.”

With the foundation finished, the team finally began construction, which, of course, presented a variety of challenges. Even with summer upon them, students would be on and off the campus for various activities. “We had to bring in a crane with a 150-foot stick,” Scates says. “Having it fall over would be catastrophic. We cordoned off the area to keep students as far from the construction as possible. We also recognized that proper phasing was integral to project safety.”

In order to erect the 120-foot clearspan roof joists, the first three and a half walls had to be built and in place. An opening had to be left to allow the crane to exit the building. “We then had to back it out carefully before we could pour the slab for the final wall,” German comments. “I have to admit it seemed as if a new challenge presented itself every time we looked up.”

“Fortunately, everyone on board had worked together for years,” Scates adds. “We were a team with a mission. When the challenges came, we simply took them on one at a time.”

One of those challenges was the threat created by Hurricane Rita. “The walls were 50 percent complete when we heard about the impending storm with expected winds of 80 mph,” German remembers. “We knew we were going to get high winds, if not a storm itself. We spent the next week preparing for it, bracing those walls as best we could. Fortunately, the storm never materialized this far north.”

Now that the facility is up and running, Horn and Charter-Heery can sit back and relax as they share the story. “This was probably the toughest \$6 million building we’ve

ever done,” Scates says of the state-of-the-art facility that was completed in March 2006. “I’m not sure we could have done it for this price if the various team members hadn’t been working together for the last few years.”

Horn couldn’t agree more. “There are plenty of delivery methods out there. We could award projects to different contractors every time and get the lowest price, but then we would have to start over with each new project. Charter-Heery knows what we expect and works hard to deliver the facilities they’ve been assigned. In the case of the gym at MacArthur High School, they went above and beyond the call of duty.”

MacArthur High School



Chad Davis Photography

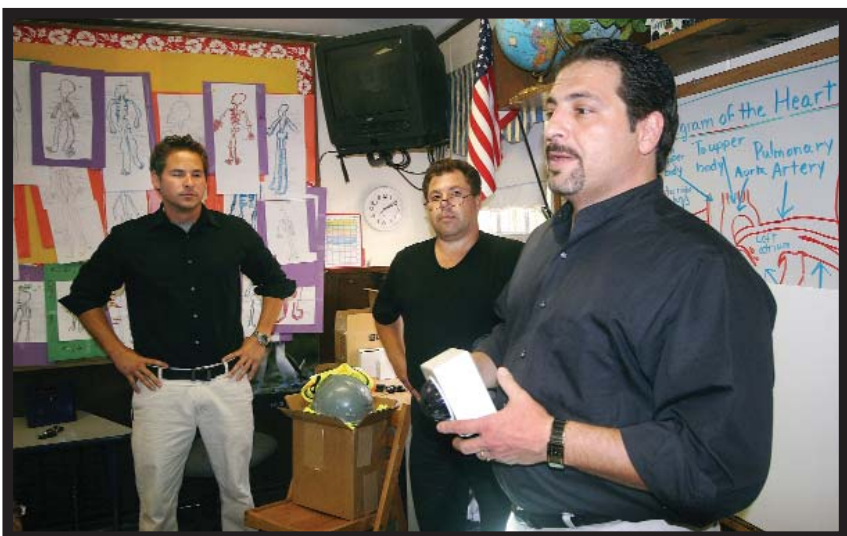
IN THE COMMUNITY

▼ For the fourth consecutive year, **Heery's Houston staff** once again co-chaired the Barbara Jean Hoffman Memorial Foundation's annual golf tournament. Proceeds from this event have provided over \$100,000 worth of scholarships for needy **Houston area high school graduates**. Additionally, contributions have helped to equip thousands of underprivileged students with free school supplies. Daryl Bailes of Heery's Houston office has committed to chair the committee for this important event again in 2007.



■ **Charter Builders/Heery International's Dallas** group joined the long-standing golf tradition this year as it hosted its third annual golf tournament for architects, engineers, subcontractors, suppliers, vendors and school district personnel. Nearly 170 participants gathered in 42 foursomes to play golf and tell tall tales. **The Mabank Independent School System** was the winner of a \$2500 grant awarded at the tournament.

▼ It's not easy following behind a life flight helicopter nurse and a firefighter who hand out prizes, but **Heery-HLM | design's Orlando** team of Clay Ransone, Al Murro, Scott Nichols and Toby Walker were up to the challenge. The team introduced design and construction as a career to the second-grade class of a local Orlando elementary school that is also a client, the **Park Maitland School**. The pressure was on, especially because Clay Ransone's son was in the class, but our team won over these highly discriminating pupils. First, they brought along costumes of hard hats and safety vests. During the 40-minute session, the pupils learned about security, 3-D building animation (which prompted several conversations about video games) and flash animation and website graphics with an almost infectious interest and excitement. The group ended the session by handing out Heery's coveted miniature trucks, making it a slam-dunk for the architects and engineers vs. the firefighters and nurses.



► In addition to its work with Park Maitland School, the **Heery-HLM | design Orlando** office has participated in mentoring and career day programs at four local schools. At Suncoast Elementary School, Gabe Auffant and Nate Labagh joined school career day veteran Clay Ransone for a discussion on building design and job site safety, followed by an exercise to design the interior of their teacher's dream house. One of Heery-HLM | design's justice clients asked the firm to include Suncoast in its outreach plans. For his fourth year at Rosemont Elementary School, Clay was joined by Kandice Smith for a similar presentation to Suncoast's, but followed up this time by an introduction to building foam models. Since the previous presenters were a beekeeper and an owl trainer, the team had some stiff competition for the students' attention, but the distribution of Heery matchbox trucks at the end cinched the deal in the Orlando team's favor. At Apopka Middle School, a group of energetic seventh graders awaited CADD specialist Hugh McGloughlin and junior architect Toby Walker, who gave two presentations on what makes a building work. They also brought along a large physical building model that the students could touch and discuss, prompting many questions about materials, scale and construction techniques. Rounding out the mentoring/career day blitz, Cathy Tiedge participated in the Teach-In at Cypress Springs Elementary School by talking to a group of fifth grade students about structural engineering. Using construction photos of the structural system for Routt County (Colo.) Courthouse and a computer generated 3-D model of the structural system, the students were able to get an idea of how the designed system is constructed in the field.



▲ **Heery Atlanta** staff worked with a dozen high school seniors from **Osborne High School in Marietta, Ga.**, to introduce them to the design and construction industry as part of a program sponsored jointly by ACE Mentoring Capstone Project and Wise Women Speak. The students, none of whom were familiar with the design and construction industry prior to starting the program, toured the Heery Atlanta office and learned about the less obvious aspects of being an architect, such as what is behind a wall or above a ceiling. They then went through the entire process of designing a strip mall, from site selection and programming through design. They even learned some aspects of engineering, as well as construction, such as value engineering. Karen McHugh and Jacob Vagts led the Atlanta office's participation in this effort.

continued on back page

► Members of **Heery's Seattle** office gave a presentation to a local Cub Scout pack about the Beacon Hill Elementary School project, one of the **Seattle School District's** BEX II projects, in an effort to introduce the pack to the joys of the design and construction profession. Presenting the information at an eight to nine year old level, Roxann Robinson explained how a project comes together, how it is presented to the community through drawings and models, and how the architect translates design ideas onto paper so that a project can be bid and awarded to a contractor. She also talked about all the different people who work on a project: architects, engineers, contractors, trades people like masons and painters, and even project managers like Heery.



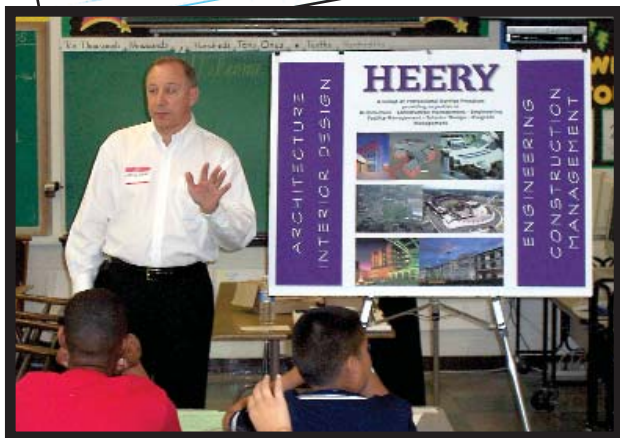
► **Heery's Dallas office** participated in an extreme mini-makeover project developed for the Wilmer Hutchins Independent School District located south of Dallas. District schools were long neglected due to problems between the administration and school board. The buildings were in horrible disrepair, in some areas literally crumbling, motivating local companies to join efforts to make a difference. Over 20 companies donated their time and resources by scraping, painting, landscaping, cleaning, repairing glass, installing acoustic ceiling tile, and making electrical/plumbing repairs.

► **Denton Independent School District, Texas**, dedicated the new \$17 million Sarah and Troy LaGrone Advanced Technology Complex in November. Recently completed by **Charter Builders/Heery International in Dallas**, the 120,000 square foot facility offers applied technology and specialized training to high school juniors and seniors in such fields as computer technology, medical health, business, education, pre-engineering, legal and protective services, visual arts and communication.



► The **Youngstown, Ohio, City Schools** recently celebrated its new Kirkmere Elementary School with a dedication ceremony and some fun at the playground. Kirkmere is the fifth new school that **Heery's Ohio** group has completed for Youngstown City Schools. Two high schools and a middle school are currently under construction.

Dear Mr. May,
 Thank you for teaching us some more about your job. I enjoyed looking at the drawings, seeing future designs and experiencing what it is like to be an architect.
 Also, thank you for the gold apple, the coin and the key chain that goes around your neck.
 Keep on designing!
 Sincerely,
 Ashley Banks
 Ashley's Project



◀ **Heery's Central Region** participated again this year in career day at Brookridge Elementary School in the **Brooklyn City School District** near Cleveland. John May, senior vice president and central region manager, answered questions from third, fourth and fifth-graders about careers in architecture.

▼ **Kenston Local Schools**, Bainbridge Ohio, dedicated their \$35 million new high school in August. The school features 60 classrooms, a 745-seat auditorium, five computer labs and an array of other facilities including two greenhouses. **Heery**

Cleveland has been serving as program manager since 2003.

► Knowing that bad news travels at the speed of light while good news travels at a snail's pace, **Heery Seattle**, with help from Sue Wasserman in Corporate Communications, has taken it upon itself to help **Seattle Public**

Schools promote positive aspects of the district's capital improvement program. The most recent endeavor, designed to gain school board and media attention, was the creation of a high-tech demonstration at Madison Middle School, which was re-opened last fall after the historic school's complete renovation. An enthusiastic band of middle schoolers treated an audience of close to 40 to an enlightening sneak peak at the district's new pre-engineering program. Project Lead the Way, as its known, will be taught to all students beginning in junior high school. The new and renovated facilities that are part of the current capital improvement program are all being designed to incorporate the program, which is certain to lead some budding engineers to Heery's doorstep.



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