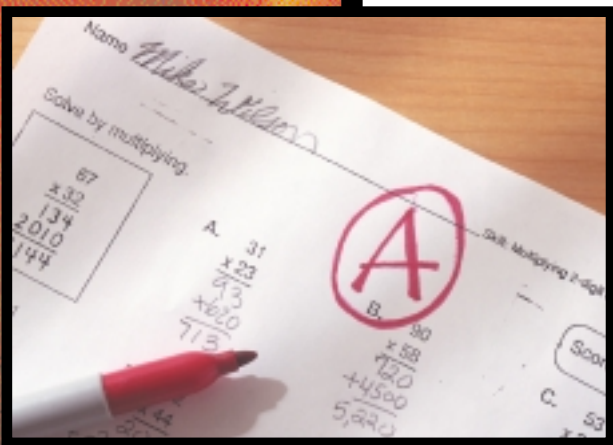


# SCHOOL REPORT

## VALUE-BASED

## Delivery Systems



A recent study of test scores before, during and after construction at the Syracuse (N.Y.) City School District demonstrates that facilities in a good state of repair have a positive effect on the learning environment, which in turn translates into higher test scores (See Research Watch, Page \_\_\_). To deliver higher quality school facilities, today's school districts have more options than

ever before. Districts must make the right choices for their facilities if they are to achieve the maximum value from each and every dollar committed to a capital program.

According to a recent study by the Reason Public Policy Institute, choosing the right project delivery system can be tough, and districts should be sure they understand the pros and cons of each delivery method. Key factors in evaluating these delivery systems include assessing the district's own needs, expectations, ability to tolerate risk, and budget.

"Every project contains some element of risk," explains Heery president and CEO Jim Moynihan. "Public agencies are by nature risk-averse, but it's important to realize that sometimes the gains of a particular approach outweigh the risks."

Let's start with a quick primer on the basic terminology and approaches. Please remember that several of these strategies are only available as demonstration projects in some states, if at all.

— **Design/Bid/Build.** This is often called "traditional" project delivery – you hire an architect, who designs the facility, and once it's designed, you bid the project and hire the apparent low bidder, who builds the project. It is very straightforward, but in reality, districts don't know the cost of the project until the end. The lowest bidder may not be the lowest responsible and fully responsive bidder. Projects that need constructibility input often suffer under this process, as do projects with tight schedules or budgets. Plus, it requires

two separate selection processes (one for the designer, one for the contractor), which can overburden districts with limited facilities staff.

- **Agency Construction Management or Program Management.** One of the original ways that school systems tapped into the private sector, this approach gives the district immediate access to facilities consulting and expert advise. The construction program manager can help the district take advantage of economies of scale by packaging different projects and suggesting delivery methods that match the specific goals for the program. Using a construction program manager gives a district access to all the different procurement options.
- **Design/Build.** The Design-Build Institute of America (DBIA) predicts that by 2005 design/build will overtake design/bid/build as the preferred project delivery method. Forty-nine states allow design/build in some form, but the application to school projects may be for demonstration purposes only, so check your local Department of Education for details. For clients who need to expedite their projects, guarantee costs and control the amount of finger-pointing that can take place among project team members, this method offers real relief. Design/build has proven very efficient for handling messy renovation projects, getting them moving expediently. Fulton County, Ga., uses design/build for many of its lighting and air conditioning renovation projects.
- **Prototypes.** Prototypes refer to any design used more than once, whether it is an entire school or an individual section, such as a media center or cafeteria. Often, districts will have several prototypes from which to choose depending on the situation. The Wake County (N.C.) Public School System re-uses the same building plans, with minor modifications to accommodate site differences. Prototypes cut between three and six months off the design schedule, save between \$300,000 and \$500,000 and allow improvements of the design to be implemented. Currently, the district uses 17 prototypes representing 60 schools. One advantage is that each time

*continued on page 2*

*Approximately 70 million students (27.8% of the population) are in nursery school through college.*

*Source: Census Bureau*

## INSIDE

Proper Project Closeout

Sustainable Schools

Construction at Occupied Schools

Community Communications

Attracting Minority Businesses

Educational Specifications/Design Guidelines

Celebrations

# HEERY

*Innovative ideas that lead our clients into the next millennium*

# Delivery Systems

continued from front page

the school is constructed, more and more questions about design details are resolved, which saves time and money. Contractors and subcontractors become accustomed to building the prototype, and develop process efficiencies. While prototypes can help control design costs and deliver equity (everyone gets the same thing), districts do well to remember that site adaptation costs still exist for all prototypes.

- **Design + Construction Management.** Some districts feel they need more control over the design of a project than conventional design/build offers, and the industry has responded. Design + construction management provides clients with a design phase manager as well as a construction phase manager. One feature of both design + construction management and design/build is that the district (through its design/builder or construction manager) can select the most responsive and responsible bidder, eliminating the real problem district's experience when they hire the lowest bidder who may not be qualified to do the work.
- **Design/Build/Maintain.** Much of the \$112 billion that the general accounting office estimates is needed to bring educational facilities up to current standards is the result of deferred maintenance. While several districts have privatized their maintenance function, Heery's first Millennium School study indicated that educators generally believed that schools systems should operate and maintain the facilities themselves. One of the issues

involved in design/build/maintain contracts is that districts, in effect, capitalize their maintenance, which is not the best value for spending capital dollars.

- **Design/Build/Operate/Maintain.** Not many districts have gone this route, primarily because design and construction folks are not generally educators. The few schools that have been developed this way are charter schools with an educational mission outside of the normal district chain-of-command. As more private operators move into the public education arena to take over specific schools, this delivery process may provide a viable option for housing these programs.
- **Design/Build/Finance/Leaseback.** Under this scenario, cash-strapped school systems look to the private sector to provide the financing for much-needed school facility projects. Also called Turnkey, this approach provides immediate relief without requiring a referendum or voter-approved initiative to fund school construction projects. But, as with everything, it comes at a price. One drawback is loss of voter support when they learn the high cost per square foot that districts pay when using this mechanism. Private entities may find it difficult to achieve financing rates as attractive as what public school districts can secure.

Which approach is right for your district? To determine this, your best first step is to determine your goals, your challenges and your ability to tolerate risk.

## RISK DISTRIBUTION IN DIFFERENT DELIVERY SYSTEMS

Delivery System	Public Owner	Architect/Engineer	Contractor
<b>Design-Bid-Build</b>	Capital Finance Risks Legal Liability Maintenance Risk Operations risk Political Risks Schedule Risk (Construction) 1,2	Design Liability Constructed Quality Risk 1	Constructed Quality Risk 1 Schedule Risk (Construction) 1,2
<b>Design-Build 3</b>	Capital Finance Risks Maintenance Risk Operations Risk Political Risks	Constructed Quality Risk 1 Design Liability 1 Schedule Risk (Construction) 1,2	Constructed Quality Risk 1 Legal Liability Schedule Risk (Construction) 1,2
<b>Design-Build-Operate-Maintain 3</b>	Capital Finance Risks Political Risks 1	Constructed Quality Risk 1 Design Liability Political Risks 1 Schedule Risk (Construction) 1,2	Constructed Quality Risk 1 Design Liability Legal Liability Maintenance Risk Operations Risk Political Risks 1 Schedule Risk (Construction) 1,2
<b>Design-Build-Finance-Operate-Maintain 3</b>	Political Risks 1	Capital Finance Risk 1 Constructed Quality Risk 1 Design Liability 1 Political Risks 1 Schedule Risk (Construction) 1,2	Capital Finance Risks 1 Construction Quality Risk 1 Design Liability Legal Liability Maintenance Risk Operations Risk Political Risks 1 Schedule Risk (Construction) 1,2
		<b>Design-Build-Team</b>	

**Notes:**

<sup>1</sup> Risk is shared among one or more of the participants (not necessarily equal potential liability).

<sup>2</sup> Schedule risk exists when liquidated damages are involved, or when the late opening of a project delays early revenues.

<sup>3</sup> Value-based Delivery System assumes abbreviated design offset and corresponding increase in Quality risk and Design Liability risk.

Source: Kenneth L. McGowan, "Value Based Delivery for Public Owners," paper presented to the National Society of Professional Engineers, July 2000, p.6

Source: Reason Public Policy Institute

# FACILITIES ASSESSMENTS

## Provide a Good Start

Heery has returned for an encore performance following the successful completion of the Dallas Independent School District's (DISD) five-year, \$275 million capital improvement plan, which began in 1992.

This time, Heery is conducting a needs assessment of the district's 257 facilities in an effort to develop a plan for a

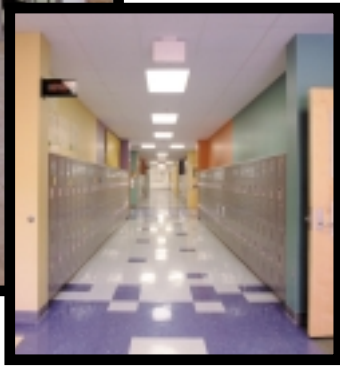
follow-up bond referendum and building improvements.

"Heery is conducting a full-scale assessment where teams of architects and engineers review every room in every facility," says Heery's Mark McCormick, who led the firm's survey efforts in Charleston, S.C., and is assisting in Dallas.

According to McCormick, once the facilities are reviewed, the findings are logged into a database, which includes a description of the work required and the cost to complete it.

DISD administrators will use the data to develop a capital plan, including its price tag. The database then becomes a giant "to-do" list enabling the district to schedule and track improvement needs, projects completed and costs.

*In the five-year management assignment for DISD's \$275 million Capital Improvement Program that began in 1992, Heery directed and oversaw the planning, design and construction of sixteen new schools, major building additions to eleven existing elementary schools, and comprehensive repairs and upgrades to over 180 additional schools and district facilities.*



# RESEARCH WATCH

## Report Links Math Achievement to Renovation

Updated facilities have a positive effect on student math achievement and parent participation according to a 1999 study – School Building Renovation and Student Performance: One District's Experience.

Cornell professor Lorraine E. Maxwell, Ph.D., conducted the survey in cooperation with the Syracuse (N.Y.) City School District (SCSD) using data on student performance from before, during and after the renovation of several school buildings.

Researchers examined standardized reading and math scores of all SCSD third- and sixth-graders from 1982 to 1997 and compared them to its capital improvement program, which began in 1984 and continued until 1994 – at which point about half the district's student population attended renovated schools.

The study concludes "physical environmental attributes of school facilities play an important role in students' academic performance, attitudes and behavior."

In addition, the report claims another benefit of renovation is the increase in school pride and parent participation. "Schools whose PTA organizations were virtually non-existent beforehand saw parents take an interest in the goings-on at the school."

Even though they studied both math and reading scores, only the math showed significant improvement. The author speculates that this may have resulted in an influx of students for whom English was a second language.

Other findings include the perceptions school officials have on construction. According to the survey, school administrators felt that exposure to dust, noise and the

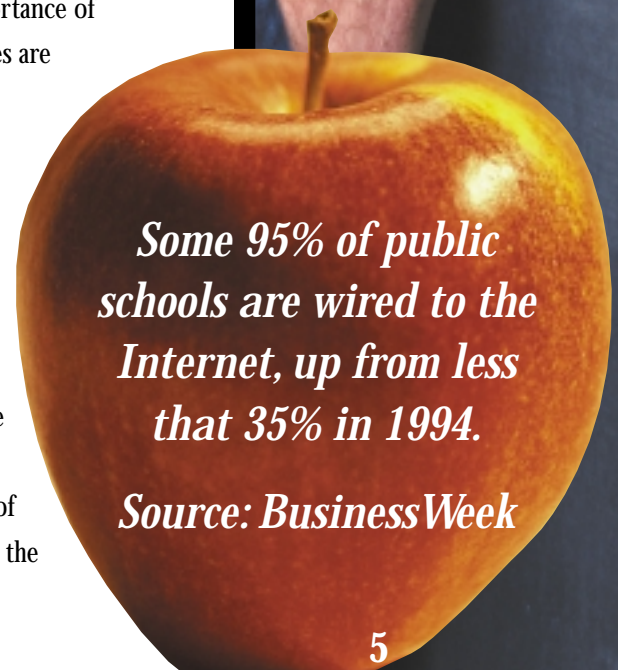
presence of workers and machinery caused a decline in student achievement during the actual construction period.

The author warns that even though students seem to recover once the construction is complete, the timing is important. She recommends that school administrators and facility planners consider avoiding construction while school is in session or moving students to a temporary facility while renovations take place.

Although this study demonstrates a positive relationship between upgraded school facilities and math achievement, the author cautions that the sample was relatively small and recommends that further research incorporating schools in urban, suburban and rural communities be conducted. The author also recommends that future research include data on teacher turnover, absenteeism and student disciplinary occurrences.

Furthermore, the author recognizes the importance of future research to establish which facility attributes are most effective in improving student learning. This research was included in Heery's Millennium School 2000 survey, which revealed that educators felt basic environmental comforts such as climate control and lighting had a greater effect on student achievement than technology and classroom flexibility.

This report was supported by grants from the Council of Educational Facility Planners, International and the Cornell University College of Human Ecology. For additional information about the report, contact CEFPI at [www.cefpi.com](http://www.cefpi.com).



*Some 95% of public schools are wired to the Internet, up from less than 35% in 1994.*

*Source: BusinessWeek*

# Statewide Construction Programs Create Equity and Efficiency

Heery's Mike Brown rises with the chickens to get his job done. Brown is the program director for Heery's share of the Ohio School Facilities Commission (OSFC)'s eleven school districts. The work keeps Brown busy, requiring him to zip across the state's northeast quadrant.

In 1997, the state of Ohio formed the OSFC to provide funding, management oversight and teaching assistance to its school districts for construction and renovation of school facilities. In this arrangement, the state provides a portion of the necessary funding, while the school districts make up the difference with local resources. OSFC was founded to help insure equity in public school facilities across the state.

Today Heery, with Brown at the helm, is currently responsible for the following school districts -- Bristol Local, Claymont City, East Liverpool City, East Palestine City, Leetonia Exempted Village, Lisbon Local, Southern Local, Steubenville City, United Local, Wellsville Local and the newly awarded Youngstown City involving a new high school, three new elementary schools, and twelve renovation/addition projects -- with a combined budget of about \$340 million.

New Jersey Governor Christine Whitman signed the New Jersey Education Facilities Construction and Financing Act into law for a similar reason -- the directive will allow school facilities and programs in 30 special needs school systems to be brought up to par with other systems in the state. The New Jersey Economic Development Authority selected Heery late last year to implement a statewide school finance and construction program.

With statewide school construction programs, one buzzword is equity. This macro approach to school construction develops procedures for financing and managing construction and renovation projects in public school districts within the state, theoretically creating equal opportunities for all school systems serviced by the program.

Another result of working together to fund and manage school construction projects is increased efficiency. With a statewide program that establishes guidelines for program requirements and documentation, school districts can more effectively develop and implement successful construction programs in accordance with state education standards.

"Consistent reporting and procedures uniformly applied by all of the project teams will create higher degrees of efficiency and accountability, as well as improve the delivery of services to the schools," said Dave Young, who will serve as project director of another newly awarded statewide construction program -- this one in Arizona.

The Arizona School Facilities Board (ASFB) hired Heery for internal program coordination for its \$1.2 billion school deficiency correction program. Heery staff will manage and coordinate the efforts of eight other construction management firms also selected to participate in this massive three-year effort.

Heery's experience with large and small school districts throughout the U.S. has prepared the firm well to apply its' knowledge to these statewide programs. The world's leader in K-12 construction management, Heery has helped both public and private institutions improve their learning environments for more than 1.2 million students in 130 school districts from coast to coast.

*Caption*

Photo to Come

## E-GROUP

### Links K-12 Expertise

Heery's K-12 clients are virtually a click away from capitalizing on the firm's K-12 experience from coast to coast.

Following the firm's Education Summit last spring, Heery Program Manager Joseph Sanches developed an email discussion list dedicated to allowing Heery employees to share information on K-12 facilities construction and renovation. Within weeks of returning to his assignment in the U.S. Virgin Islands, Sanches put the word out about the list and nearly 100 fellow employees signed on. The list is now up to 115 people.

"I just really wanted to build on the excitement generated at the Education Summit, to find a way to keep it going," says Sanches.

Sanches, a subscriber of a number of email discussion lists and electronic newsletters, says it occurred to him that he and his co-workers could benefit from a similar exchange.

"Employees assigned to Heery's school facilities projects possess a great deal of knowledge that should be shared, and I felt we needed a vehicle for those exchanges. We always say that if we haven't seen it, there's someone in the company who has," says Sanches.

The discussion list has fielded questions on things as varied as the removal of gum from school sidewalks (an age-old concern for administrators) to the design of sustainable facilities to how to deal with cracks in interior and exterior masonry. The most active thread within the list has been a continuing discussion on quality management.

In addition to offering a forum for Heery employees to share data on various topics in K-12 construction, Sanches maintains a large directory of files useful to school construction consultants. There are documents that will take you from the pre-design phase to post construction, offering assistance with everything from developing your construction program requirements to standard punchlist forms.



# What About the Furniture?

Put yourself in this picture. You worked hard to get voters to approve the funds to renovate your old schools and construct several new ones. You've spent a lot of money on these facilities. The wiring, heating/ventilating/air conditioning, and lighting systems are top notch. Everyone's thrilled with the new space.

In walks the newly appointed principal, who asks "what about the furniture?"

If you're like the Seattle Public Schools (SPS), you're one step ahead of the principal right now. When Seattle passed its \$350+ million school levy in 1995, it included funding for new furniture for the 19 schools affected by the construction program. Knowing this, Don Gillmore, SPS's Building Excellence Manager—South End worked with Heery's Andrea McLean to develop a clear process for making sure the district selected the best quality, most appropriate furniture it could afford.

At the October 2000 Council of Educational Facility Planners International conference, Gillmore and McLean outlined the major parts of their approach. The cornerstone? Destructive Product Testing, a process that requires an independent laboratory to test products by several well-known commercial quality standards, rather than relying on manufacturers' claims.

From the beginning, the Seattle Public Schools took control of the process, setting strict budgets for furniture, fixtures and equipment, rather than simply giving a general allowance and a product catalog to the principal. They conducted a complete inventory of existing materials and created a database of schools and materials they currently had.

Next, they undertook a thorough review and update of the district's 15-year-old standards, including examining all 187 items on old list. They deleted some items and added new ones to develop an appropriate list of materials to support the current curriculum, which could be applied to all schools.

One step that streamlined the process and helped establish furniture equity among the schools was the development of prototypical room lists. Gillmore and McLean divided a "standard school" into five groups and developed a common list of furnishings for each group: office/administrative; classroom; cafeteria; libraries/specialty areas; technology.

Next came a definition of quality standards. The district gave a general description of the product, for example, 16 gauge steel legs, 1" diameter; the quality standard the district expected (manufacturer/model number); specific product performance requirements; options for finishes; and a price range.



The district then set up a series of elimination rounds. A key strategy was a district-sponsored Furniture Fare, at which manufacturers brought product samples they thought would meet the district's quality standards. To be invited to the Furniture Fair, a manufacturer had to respond successfully to an RFI explaining how its product met the quality standards. Successful manufacturers received invitations to the Furniture Fare, which they had to attend if they wanted to advance to the next step. District personnel reviewed the products side by side by category and inspected and rated each one. Manufacturers were prohibited from "selling" at the Furniture Fair.

Products that passed the Furniture Fare criteria were eligible to move on to the next phase of the project unless it was determined that product testing was needed. This crucial step was for products that represented the largest purchases and biggest disparity such as student chairs, chair/desk combinations, computer chairs, cafeteria chairs and tables.

Why this extra step? At the end of the fair, the district discovered (as just one example) that five different student chairs met the specifications, but ranged in price from \$15 to \$75. If making the purchase decision on price alone, the district would simply buy the \$15 chair. But consider that this chair would be used at all 19 schools and represented a substantial investment for the school system. From this perspective, quality moved front and center in the decision-making process.

According to McLean, the independent laboratories conducted both functional tests (where the products were put through normal wear-and-tear) and proof tests (where products were stressed to the breaking point, similar to vandalism). If a product failed the functional test, the district immediately eliminated it from the bid process. Only products that passed the testing were allowed to bid for the district's valuable 3-year contracts.

The results: better products and prices. The district shared the testing results with manufacturers, enabling them to improve their products and be in a better position for the next round of selections. Those selections should be starting soon—the district's voters just approved another construction levy to renovate and build more new schools.



*Almost three quarters of last year's construction dollars were spent on providing new space.*

*Source: School Planning & Management*

# CELEBRATIONS

## Claymont High School

Claymont High School in Tuscarawas County (Ohio) dedicated its new facility February 25. The new building houses 750 ninth- through twelfth-graders. Claymont City Schools received assistance from the Ohio School Facilities Commission (OSFC) for a new high school and renovations to two elementary schools and a middle school. OSFC provides funding, management oversight and teaching assistance to Ohio school districts for construction and renovation of school facilities. The state will provide a percentage of the necessary funding and the districts must make up the difference with local resources.

Photo to come

## Nashville Pencil Partners

In addition to providing program management for a new addition at Granbery Elementary School, Heery's Nashville office adopted the school in 1996 through the Nashville/Davidson County Pencil Partner Program. Since then Heery has actively supported school fund-raisers, special holiday activities, and the school's Junior Achievement Program. Heery has also sponsored field trips, organized company workdays for planting and landscaping school grounds, donated office equipment, and worked with students in the classroom.

Heery's staffers work directly with students to teach them about the construction industry, and recently Heery partnered with The Home Depot to fill the school's newly constructed interior planters with beautiful living plants. To show their appreciation, Granbery's students, teachers and staff held a dedication ceremony in Heery's honor.

Most recently, Heery's staffers have been tutoring students under the school's MVP program. This program provides tutoring for kindergarten and first-grade students who need extra help in reading and writing and involves weekly one-on-one assistance.

## Under Construction Becomes Useful Instruction

Educators overwhelmingly agree that a construction program can be a great learning tool, according to Heery's Millennium School 2000 report.

For nearly 10 years, Heery has sponsored model-building activities and contests in nearly 20 districts across the country to involve students in their school building programs, promote student interest in the design and construction professions, and expose them to a new way of thinking about the structures around them.

"A school that is under construction or renovation provides an excellent opportunity for students to learn about the design and building process," says Kristen Freeman, who

*Heery President and CEO Jim Moynihan helps Seattle elementary school students build edible models of their school. Heery involves students in their construction programs, giving the children, as well as their families, teachers and community members, the opportunity to feel a part of the building process.*



# HEERY

www.heery.com

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

© Heery International Inc., 2000. *Heery School Report* is published two times per year. All rights reserved.

developed Heery International's student outreach program. "By tapping into the students' natural curiosity of the construction around them, Heery involves the children in the construction process."

Students have put their skills to the test modeling schools, stadiums and parks with everything from cardboard, construction paper and Popsicle sticks to marshmallows, Twinkies and graham crackers. Using concepts of math, science, language arts and team building, students learn about form, scale, color, texture and materials along with basic architecture, engineering and construction concepts. In addition, in-class activities involve learning to read blueprints and elevations, and using those documents to build models of the school or other buildings.

"We tailor activities to meet each school or district's needs," says Freeman. Programs range from two-hour, in-class projects to system-wide design contests.

Not only do these activities provide a great opportunity for the students, Heery staffers get a lot of enjoyment from them as well.

"I love to see a child's face when he or she sees a blueprint of their school for the first time," says Freeman. "Most will quietly look at it and point to their classroom or playground, keeping their distance as if the plan might reach up and bite them. By the end of the session, the icing mortar between their graham cracker walls is artfully spread all over the same plan and the students are begging to munch on their models."

## Web Site Links Community to School Facilities News

Wake County Public System in Raleigh, N.C., serves a community of web savvy citizens actively involved in the area's schools. Through the district's web site, parents and taxpayers can subscribe to email newsletters and download school profiles. Recently Heery completed an overhaul of the district's Auxiliary Services Division's web site. The redesign, which neatly integrates the graphic look of the school system's existing web site, features detailed information on the Division's organizational structure, bid dates for state- and county- bond funded construction projects, and a comprehensive history of the school system's construction progress. Other features of the site include links to helpful Internet resources on school facilities and a FAQs page complete with downloadable fact sheets on some of the system's policies regarding its facilities.

The web site also contains another useful feature – individual pages for each of the district's 122 schools. On each page, visitors will find a photo of the facility, a link to the school's web site, and past and current construction projects on the campus. The entire site comes together to put a wealth of valuable information at visitors' fingertips.

The Wake County Public School System, which serves 98,000 students, is the second largest in North Carolina and the 27th largest in the County. Heery has enjoyed a successful 15-year relationship with the district, delivering a total of 49 new schools, 120 addition/renovation projects and 89 building system replacements and upgrades.

## Block Kids

Heery staffers from the Baltimore area recently supported the National Association of Women in Construction's Block Kids program, which teaches construction concepts to children with physical and mental disabilities. More than 70 children participated in this year's event, which was held at Kennedy Krieger School in East Baltimore. The children created small building models using Legos, and were rewarded with prizes. The University of Maryland, Baltimore, a Heery client, coordinated the event.

