



The Vista's central lounge is an inviting space placed between the Garden Wok and Main Street dining areas.

A RECIPE FOR LEAN IPD AT MSU'S NEW DINING HALL

By Mary E. Kremposky, Associate Editor

“Too many cooks in the kitchen spoil the broth” is a common phrase that has clearly been proven false at Michigan State University’s newly transformed dining facility called The Vista at Shaw Hall. The phrase might hold true for cooks in the kitchen but not for building the kitchen, itself. In addition to MSU as owner, Neumann/Smith Architecture, Southfield, was joined at the design table not only by Clark Construction Company, Lansing, but by the chef, facility managers and operators, four trade contractors and two engineering firms. This type of collaboration is one of the main ingredients of a new approach called Integrated Project Delivery (IPD). MSU’s latest dining facility is also now the first true Lean IPD project at a public university in the entire country.

MSU solicited a combined proposal from the architect and contractor as part of this new method for “cooking up” or delivering a project.

Neumann/Smith and Clark also joined forces with Peter Basso Associates, the Troy-based mechanical and electrical engineer, to secure the project. Architect of record, contractor and owner then worked under one contract, sharing both risks and rewards throughout this collaborative venture. Mesher, Shing, McNutt is the design architect based in Seattle, Washington.

Four trade contractors joined this project roundtable as signatory partners to the agreement, including Motor City Electric, Detroit; John E. Green Company, Highland Park; Dee Cramer, Flint; and Great Lakes West, a food service equipment company based in Mattawan, MI. “Having everybody at the table before we started designing and then gaining all of their input was very beneficial,” said Neumann/Smith Design Director Emil R. Sdao, RA, LEED AP BD+C.

Like the healthy servings of broccoli and fresh greens in the Garden Wok

- one of six food venues in The Vista's three different restaurants – MSU went beyond IPD to create a healthy project of added value and a trim “waste line.” “Given that MSU not only changed the contractual form of project delivery, but rather opted to embrace a change in how a project organization and operating system is approached, the proper name for what MSU has engaged in is Lean IPD,” said Tariq Sami Abdelhamid, PhD, MSU’s Integrated Program Organization Advisor, Division of Residential and Hospitality Services (RHS). Abdelhamid served as a type of coach or executive chef steering the project team through this new delivery method.

MSU invested in the Lean IPD process by offering eight days of workshops over four months to the project team. Lean Project Consulting’s Hal Macomber provided the training and initial coaching. The team chose to delegate process implementation and ongoing coaching responsibility to Tariq Abdelhamid. “Tariq even gave us homework in the form of reading assignments,” said Clark Senior Estimator/Planner Garry Myers. “We would call in on a given day and discuss how we were applying that knowledge to what we were doing on the job.”

The project team did its homework, and did it well. Although the University is still benchmarking the project, preliminary results are impressive: “On a project of this size, we would have expected 144 Requests for Information (RFI), but we only had 12,” said MSU Construction Contract Administrator Jack Mumma. Seating almost doubled from about 455 to approximately 720. Based on preliminary data, the cost per seat on the project was about 15 percent lower than MSU’s other dining hall projects, added Mumma.

The year-and-a-half invested in the collaborative design process translated into a less costly construction administration phase, both for the architect and the construction manager. “From an architectural standpoint, we spent a lot more time upfront in design, but we spent a lot less time in construction administration,” said Neumann/Smith Principal Stanley E. Cole, AIA, LEED AP BD+C. “Because everything was already figured out and the tradespeople were working together closely, we were 28 percent under what we typically spend on this type of project for construction administration. That savings ended up going back into the project.”

In reviewing this project approach, Amr Abdel-Azim, Architect III, MSU Physical Plant Engineering and Architectural Services, said, “The biggest advantage of this delivery method is you have a contractor who is part of the solution from the very beginning. When construction begins, we have somebody who is very familiar with what they are going to build, where they are going to buy materials, who are the suppliers, and how much it will cost. The fact that they hit the ground running from day one is really the advantage.”

A sense of camaraderie was an intangible benefit of the project. “Aside from all the numbers and the great results, one of the major benefits we have achieved is the friendship and the camaraderie that came out of this project,” said Abdelhamid. Rapport replaced rancor with “the ‘hair-on-fire index’ coming in at five as compared to the 65 or even 85 on more typical projects,” he continued. “This was a pleasant project to work on, with so many people having contributed to its success who are not present at this interview.”

LET’S DO LUNCH

The tangible benefits - food, flavor and a wonderful place to dine - have also been a great success. Out with the bland and in with a varied bounty of great food – think spicy honey-glazed chicken, cranberries and mashed yams in the Main Street dining area and Mongolian beef stir fry and bok choy cashew salad in the Garden Wok.

The large open bullpen of a conventional cafeteria has been replaced with three, intimate restaurants “designed to be dynamic, vibrant and alive,” said Sdao. With bold colors and imaginative light fixtures dominating the eateries with lantern-like globes, the interior surpasses the quality of many private restaurants. Thanks to a new glass curtain wall, the dining hall now has a clear view of the sinuous curve of the Red Cedar River coiling through the campus. At night, the glow of these unique light fixtures and the dining hall itself becomes an attractive beacon visible in the immediate vicinity and from the main bridge of

Farm Lane, one of the main campus thoroughfares.

The Vista at Shaw Hall is a magnet attracting students from the residential halls and from the surrounding academic classrooms. “The popularity of the Garden Wok area is evident by the line wrapping around the corner and into the hallway every day,” said MSU Assistant Project Manager for Culinary Services Carolyn Roy. “The number of residents that don’t live at Shaw Hall but come here to eat is still increasing.”

Due to RHS’s early collaboration in the IPD process, The Vista at Shaw Hall is an operational success. “We have minimal issues,” Roy continued. “It’s a big success with everything working, everything flowing, and customer recognition that it is a different kind of space. The project is definitely successful.”

VARIETY IS THE SPICE OF LIFE

MSU has been transforming all of its dining facilities over the last decade, essentially creating culinary hubs in each “neighborhood” or cluster of residential halls. The Vista at Shaw Hall is part of the River Trail Neighborhood, along with McDonel Hall, Owen Graduate Hall and the Van Hoosen Apartments. Because this neighborhood is essentially an island in a sea of academic classrooms, The Vista services both residents and the general student population. “Many academic classrooms surround Shaw Hall, making it an incredibly popular place to eat lunch,” said Roy. “We wanted a nice facility for the students living



PHOTO BY NEUMANN/SMITH ARCHITECTURE

The Garden Wok has an Asian feel, complete with folded or accordion-like ceiling soffits of bamboo that resemble a type of wood Origami – the Japanese art of folding paper into different shapes.

in this neighborhood and for this huge lunch crowd, as well.”

Beyond cosmetic changes in the late '80s and in 2001-2002, Shaw Hall's dining facility was essentially unchanged since the year of its original construction in 1949. To raise the dining experience to a level comparable to MSU's other renovated facilities, the \$12 million project called for a new kitchen and dishwashing area, new student lounges, new East and West lobbies, a new loading dock and recycling center addition, new MEP systems and a dramatic transformation of the entire dining area. MSU established a temporary dining facility on the lower level during construction.

Today, both the menu and the layout of this once traditional cafeteria have been completely revamped to nourish the eye and satisfy contemporary taste buds. Each of the three restaurants - the Bread Box, the Garden Wok and Main Street - offers two different food venues. Each also offers its own unique design flavor, along with clusters of varied seating types and even different flooring surfaces.

The project team converted back-of-house kitchen areas into the Bread Box, a breakfast and lunch venue. “The Bread Box has a wood-stone

oven for pasta bakes and pizza, as well as a sandwich and deli-making area,” said Roy. Across the main corridor, stroll into the Garden Wok and enjoy either made-to-order stir-fry dishes or an entire section dedicated to salads, vegetarian and vegan foods. According to Sdao, the Garden Wok has an Asian feel, complete with folded or accordion-like ceiling soffits of bamboo that resemble a type of wood Origami - the Japanese art of folding paper into different shapes.

The project team removed the old hall's standard ceiling and fluorescent lights to “give greater volume to the space,” said Sdao. Today, the entire dining hall has an exposed ceiling with a varied arrangement of different types of ceiling soffits.

A central lounge with soft, curved seating and a flat-screen television separates the Wok from Main Street, the dining area offering home-style meals, as well as a burger sandwich-type grille, said Roy. This eatery offers spacious curved booths for large groups, plus other types of seating for smaller gatherings. Diverse types of communal seating helped to make possible the expansion in the dining hall's overall seating capacity, along with the use of two renovated residential lounges at either end of The Vista that do double duty as overflow spaces for dining.

Both the wonderful view of the Red Cedar River from seats clustered along the new glass curtain wall and the layout of the new dining hall were made possible by the collaborative efforts of the IPD team. “Originally, the new windows were not part of the project, but through the design process and IPD, we were able to incorporate them into the project and still stay within the budget,” said Cole.

“Before the renovation, you couldn't see the river because the sill was up so high,” said Sdao. “The renovation dropped the sill to the floor and called for the installation of all new glazing. We took out all the existing windows, opened it up more and put in a new system with less mullions.”

Ironically, this beautiful vista - the source of the dining hall's name - and the actual layout of the dining areas are both based on the calculated avoidance of asbestos. A ceiling in the lower level contained most of the asbestos, which if invaded or disturbed by new power or water lines would be expensive to abate. “Basically, we drew a line across the building where the venues are now and said from that line to the exterior glazing we are not going to place anything that is going to require new power or water,” said Cole.

Again, the collaborative nature of the IPD approach eased this process. The project team worked together to “fit this project in without getting into a large amount of asbestos abatement elsewhere in the building,” added Myers. “The building was built back in the '50s, so there were certain areas where there was asbestos and certain areas where there was not. We had to work the design around this challenge.”

LEAN IPD IN ACTION: MONEY AND TIME

The Vista was an ideal test case for IPD because of its relatively modest cost and because the renovations of other MSU dining halls provided a good point of comparison. “We wanted a project big enough to learn, but small enough to limit any potential concerns,” said Mumma. “Basically, the test tube was the right size. Also, we thought we would be in a good position to judge value on this project, because the project is our fourth major food service renovation in the last 10 years.”

Having worked together extensively and successfully in the past, Neumann/Smith and Clark Construction were the ideal project team for this IPD test case. “We wanted the team to come together and to be happy to work with each other,” said Mumma. “We weren't interested in a shotgun marriage.”

The project team also felt a strong comfort level with the University as an IPD partner. “The tipping point for us in selecting the team was when the president of Clark Construction (Sam Clark) said during the interview, ‘We don't know much about IPD, but I can't think of a better opportunity to learn about this approach than with MSU,’ said Mumma. “That spoke to us, because we knew

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what we didn't know also. It was a good chance to learn together."

Unlike traditional project delivery, the contractor works directly with the architect from the very genesis of the design, continually providing target costs for each different system. "In traditional delivery, the architect comes up with the design, and we then price the design," said Myers. "Typically, everybody has to repeat the process, because it is usually over budget."

In Lean IPD, the rhythm of the project was essentially one week of conceptual design, followed by one week of pricing for each system. "In IPD, it is a process of continuous estimating," said Myers. "Every week we would talk design concepts and then the following week, we would talk prices to see how those concepts were going to work, budget-wise. We moved from one area of the project to the next in the necessary order. For example, we examined the best place to locate the elevators, and then we looked at the best pattern for the layout of the venues."

Abdelhamid calls this Lean process Target Value Design. As a cost example, "the architectural package had to cost \$3 million dollars," said Abdelhamid. "It cannot go above that amount, so we essentially designed to the budget; we didn't budget to the design."

Target is the key word in Target Value Design. "The targeted value could be cost, time or quality," said Abdelhamid. At The Vista, Target Value Design was also applied to the schedule. The Vista at Shaw Hall was delivered over to the University a full three weeks ahead of its official grand opening to students. Typically, MSU's Residential & Hospitality Services staff has only a weekend to train, prep and prepare for the onslaught of thousands of hungry scholars. "Even up to schematic design, the date for substantial completion was January 2, 2013," said Abdelhamid. "During design development, one of our RHS colleagues suggested December 14, 2012. The team said, 'We will take that on.' It meant a lot to have it delivered that early."

Myers attributes the team's ability to meet that challenging target date to another Lean IPD concept: Pull Planning. "Pull Planning is a process in which we actually work backwards from set milestones," said Abdelhamid. "In this way, we understand exactly what we need to do in order to reach the milestone. We solicit commitments, and we hold each other to those commitments. The team was basically holding each other accountable."

"The Pull Planning process is part of a system called the Last Planner® System, which was fully deployed during the construction phase," Abdelhamid continued. "During design, Diane Schimizzi, the MSU designated Project Steward, kept everyone on track. This role went to the project superintendent Bill (Jake) Jacobitz from Clark and Chris Barnes from MSU. Lean



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Each of the three restaurants - the Bread Box, the Garden Wok and Main Street - offers two different food venues. Each space has its own unique design flavor, along with clusters of varied seating types and even different flooring surfaces.

Construction has many other processes that were deployed during design, such as set-based design, choosing by advantages and A3 Thinking. During construction, these processes include 5S, waste reduction practices and daily huddles.”

COLLABORATE, REALLY COLLABORATE

This new way of working is based on collaboration not as a vague concept but as a results-driven approach. “We organized ourselves from the very beginning to be collaborative in everything we did on the project,” said Abdelhamid. “We did not collaborate just to collaborate but to get better results.”

The project team, including Nowak & Fraus, the Pontiac-based civil engineers for the loading dock addition, co-located in a first-floor meeting room

in Shaw Hall. At 10 percent design completion, the three trade partners signatory to the agreement – Motor City Electric, John E. Green Co., and Great Lakes West - joined the project’s “think tank” that ultimately met once a week over the course of 18 months. “We then bid out 30 percent of the project in a conventional manner, mainly for the general trades, such as painting, flooring, drywall and glazing,” said Mumma.

The trade contractors were pivotal to success, especially in an existing building. “With existing systems in the ceiling and existing systems in the floor, a great deal of investigation was needed as to where to insert new infrastructure,” said Sdao. “The team really helped us design the project. We really needed the involvement of the mechanical contractors, because the existing area where all the mechanical systems originated is located in

a space with very limited head room that is packed with a great deal of equipment. They helped us to locate units and to figure out how we were going to get the ductwork into this space.” Holly-based HVAC/sheet metal contractor, Dee Cramer, Inc., also played a pivotal role and even managed the project’s Building Information Model (BIM) used primarily for clash detection.

There is a learning curve in any new approach. “Some trade contractors are used to design assist in which the architect designs and the trade contractors estimate what is given to them,” said Abdelhamid. “In IPD, one doesn’t just estimate what the architect provides. We want actual input to the design, so that the project comes out to the budgeted cost. We want the trade contractors to actually redline the drawings.”

Owners on an IPD project must also change their customary behavior. “The process requires changed behavior on the part of everyone,” said Abdelhamid. “The owner can’t sit back and watch from afar, because it is a multi-party agreement. You must provide the team with prompt decisions to avoid delaying the project, and you must be open and transparent with the team. It’s a very active role that some owners may not be used to or comfortable doing initially.”

RISKS AND REWARDS

In IPD, the name of the game is one project, one team united by a contract of mutually shared risks and rewards. “The architect and contractor had their profit completely at risk with each other,” said Mumma. “If one had an overrun, the other was going to pay for it and vice versa, so they needed to be working with each other.” The four trade contractors were also part of this “game” of risk and reward.

“MSU was going to pay the direct costs on the project,” said Mumma. “There was a small construction risk contingency, and if we exceeded that amount, then the anticipated profit of the trade partners was going to be reduced.”

The project had two separate contingencies: MSU’s two percent contingency for hidden, existing conditions, and the two percent construction risk contingency. “The team did a tremendous job of identifying everything they could as part of the construction risk contingency,” said Mumma. “They didn’t just throw out a five or seven percent of construction as contingency. Tariq (Abdelhamid) has a great line: ‘Contingency is planned waste.’”

As the basis for release of any reward, the project team elected to use a rating system or a scoring metric partially based on meeting construction management goals of time, quality and cost and partially based on how well the team met the parameters of what has been called the Five Big Ideas. “The risk pool was divided into 65 percent for construction management goals of

Sustainable Design at The Vista



MSU’s The Vista at Shaw is a “Spartan Green” dining hall, executed with sustainable construction practices and promoting a variety of sustainable building features and programs. The project is LEED Registered with the certification goal of Silver. Sustainable design measures include: Energy-efficient HVAC system; automatic control of ventilation during periods of low occupancy; energy-efficient light and controls; water-conserving plumbing devices; daylight controls; variable air volume for kitchen hoods; variable volume pumps; sub-metering of utilities; high-quality, environmentally friendly seating made of recycled materials; composting of food waste (pre and post); low-flow plumbing fixtures to achieve 20 percent water savings; 84 percent of construction waste for the project was diverted from landfills; 11 percent of construction materials came from recycled content – flooring, metals, concrete, finishes and more; 21 percent of construction materials came from local and regional sources within 500 miles of campus; and low VOC paints and coatings were used.

time, quality and cost," said Abdelhamid. "Then 35 percent of the risk pool was based on how well the team met the spirit of the behaviors of these five ideas. You get 100 percent back of the 35 percent or a proportion thereof based on how well you did on these behaviors."

Abdelhamid lists the five concepts: Collaborate, really collaborate; increase relatedness; conduct the project as a network of commitments; couple learning with action; and optimizing the whole. The management team rated the project team on these behaviors once a month. "In rating the team, we explained what evidence we were looking for in each of these categories," said Abdelhamid.

The ratings range from best in class to poor. "In the learning through action category, one of the fundamental tenets of Lean IPD is to learn from mistakes," said Mumma. "If we did poorly on something, we would talk about why and discuss how we were going to improve. In the optimizing for the whole category, we examined if something made it easy for the architect, for example, but hard for the contractor. We also looked at if a factor made it easy on project delivery but then was not functional for the operation of the building."

The "aha moment" on Lean IPD came to Mumma when construction was 50 percent in place. One trade contractor was 10 percent below the budget estimate, while another was slightly over their projections. "The one below the estimate said, 'What are we going to do to make sure that we don't spend our profit,'" recalled Mumma. Two trade contractors then provided assistance to the third to reduce the overall cost of the project. "It was just one of those moments when you saw it all work," said Mumma.

Abdel-Azim added, "The entire team took ownership of the project. We have a set amount, and we must make our solutions meet that target. It helped a great deal that people took responsibility not only about their own piece but others as well, especially if they saw that it would affect the project or raise the price."

MSU has given presentations on their IPD experience at The Vista at Shaw Hall to national and international organizations, including the Lean Construction Institute. Only time will tell if this approach begins to infiltrate the industry or becomes more prevalent at MSU. The Vista at Shaw Hall certainly offered exciting new ways of approaching a project, including Lean techniques, IPD and even LEED strategies as the project goes for Silver LEED certification. All participants have sharpened the "tools of their trade," learned new strategies for the delivery of quality projects, and at the end of the day, have created a truly wonderful dining experience for MSU students. At The Vista at Shaw Hall, MSU students are clearly enjoying the fruits – and the vegetables – of the entire project team's labor. ☞

THE VISTA AT SHAW HALL

Owner: Michigan State University

Architect: Neumann/Smith Architecture, Southfield

Design Architect: Mesher, Shing, McNutt, Seattle, WA

Construction Manager: Clark Construction Company

Mechanical/Electrical Engineer: Peter Basso Associates, Inc., Troy

Civil Engineer: Nowak & Fraus Engineers, Pontiac

Structural Engineer: Desai/Nasr Consulting Engineers, West Bloomfield

- Asbestos Abatement – Quality Environmental Services, Inc., Fowlerville
- Electrical – Motor City Electric Co., Detroit
- Mechanical – John E. Green Company, Highland Park
- Food Service Equipment – The Hysen Group, Northville; Great Lakes West, Mattawan
- Elevators – Detroit Elevator Company, Ferndale
- General Trades – Dobie Construction, Eagle
- Foundations – Moore Trosper Construction Company, Holt

- Site Concrete – Fessler Bowman Concrete Construction, Flusing
- Masonry – Leidal & Hart Mason Contractors, Livonia
- Drywall & Acoustical – Cook Jackson Co. Acoustics, Springfield
- Walls & Roof Panels – Architectural Metals, Portland
- Roofing – Bornor Restoration, Inc., Lansing Charter Township
- Glazed Curtain Wall – Glazing Solutions, Morrice
- Earthwork & Utilities – Sandborn Construction, Portland
- Ornamental Metals – Eagle Enterprises of Michigan, Inc., Eagle
- Resinous Flooring – Stonhard, Maple Shade, NJ
- Painting – Niles Construction, Flint Township
- Booth Seating – Seating Concepts, Inc., Rockdale, IL
- Carpet & Hard Tile – William Reichenbach Company, Lansing

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