

# True Collaboration

BY DICK DECKER

The next generation in construction project delivery promotes cutting-edge technology and a truly joint effort early in the process.

**THE NEXT STEP IN THE EVOLUTION** of project delivery methods is upon us and goes by the name of Integrated Project Delivery (IPD). Collaboration between designers and constructors from a project's inception is the cornerstone of this method, which is relatively new yet has been increasing in popularity. What's the draw? Cost savings—big-time cost savings. The larger the project, the more savings an IPD approach can bring to the table.

So how did we get to this point? Let's step back in time a bit and take a brief look at IPD's precursors.

## Design-Bid-Build

Design-Bid-Build (DBB) has been around for hundreds—some would argue thousands—of years and is the traditional accepted project delivery method. Owners liked the concept of competitive bidding and fixed price, while contractors liked the fair and equitable concept that everybody bids on the same job specifications. Architects and engineers liked it because they were the technical managers and set the project specifications for everyone to follow. Everybody was happy, right? Well, not exactly.

Owners started to realize that project costs were higher than they needed to be with the DBB method. Contractors had to put in extra contingency money for those unforeseen conditions like design changes, late project deliveries, and a few legal costs here and there; when all the project contingencies were added up it could result in 20% to 25% of total project costs! Then there were the change orders. (Has anyone ever done a “fun” change order? Not likely.) Also, some subcontractors resisted taking responsibility for coordinating work with other subs. Designers started to get uncomfortable being held responsible to produce the perfect design.

## Design-Build

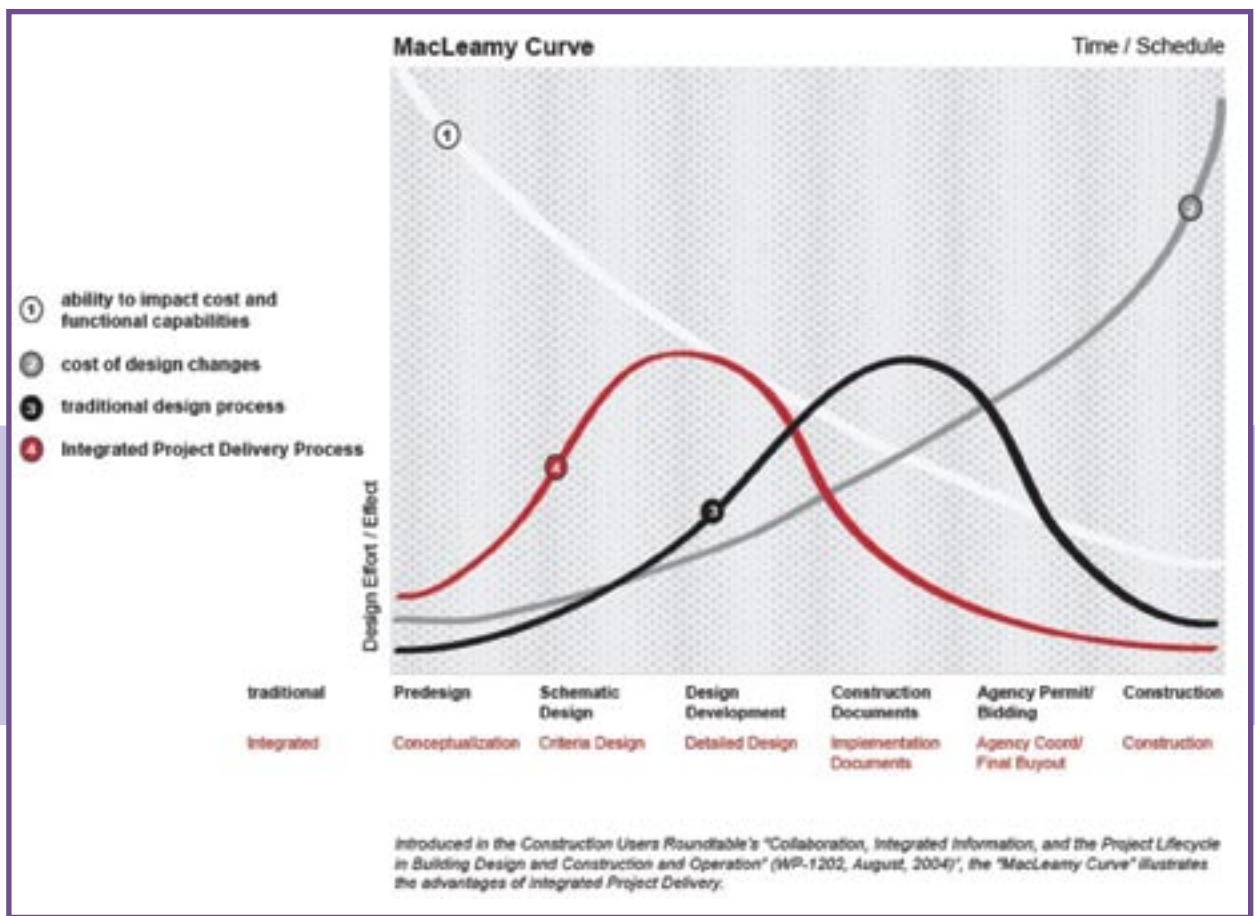
These deficiencies paved the way for the next step in project delivery evolution: Design-Build. DB allowed the general contractor to manage the complete project, usually including the designers. With DB, we had an experienced, knowledgeable entity in charge. There is no question that this increased efficiency over DBB. The successes can be measured in increased on-time deliveries and reduced costs. Clearly, the strength of DB was in the insertion of the experienced, knowledgeable project leader that was able to make informed project decisions in a timely manner. A number of GCs have been very successful with DB, as their ability to build and work with a team of people is critical to successful DB projects.

A number of GCs have taken the DB method a step further and used teams for collaboration in the initial design stage, thus creating a hybrid version of DB-IPD. However, some GCs, schooled in DBB traditional method, were staffed with managers and superintendents of the Type A, or Alpha, personality type. These “A” leaders encountered issues with developing functional, collaborative teams and as we all know, a non-functional team can fail to deliver projects on time and incur higher costs.

While DB was clearly an improvement over DBB, it did not eliminate all the problems; it just reduced them. It became very obvious that team building was probably the major determinant to a successful DB project. Getting teams to work together and collaborate—really collaborate—was the jumping off point from DB to the beginnings of IPD.

## Integrated Project Delivery

IPD is the adoption of collaborative methods, starting in the design stage, to improve some of the remaining team-building



issues with DB. Younger managers and engineers coming out of technical schools were exposed to collaborative methods and brought those concepts with them into the industry. As the successes with collaborative team-building methods began to build, the AEC industry wanted to learn more about it. The management motivation to step into IPD was there, but project management changes cannot occur without an economic incentive.

Early this century, along came Patrick MacLeamy, CEO of architecture firm Hellmuth, Obata + Kassabaum (now HOK) and his now famous curve. The MacLeamy curve (above) indicates the reason why IPD adoption has an economic incentive. The graph clearly shows the time period of a project where the greatest cost reductions can occur: during the design phase of the project. If we make the design phase of the project more efficient by having the designers and constructors collaborate, then we get a more economically efficient project overall. The creative abilities of a team of intelligent people all focused on the benefit of the project as a whole, as opposed to their own silo, is an extremely powerful cost-reduction tool!

The white line on the graph, 1, indicates that the ability to impact cost and functional capabilities of the project is greatest in the beginning design stage and lowest in the construction stage. The gray line, 2, shows that the cost of design changes is low in the beginning design stage but very high in the construction stage. The black line, 3, indicates where the greatest amount of effort is expended in a traditional project, and the red line, 4, shows the shift in maximum effort with IPD: earlier in the project where costs are more easily reduced. The obvious conclusion is that we need to move the maximum effort into the design stage where the ability to reduce project costs are higher and the cost to make changes is much lower. This is the economic message of IPD.

### True Collaboration

IPD is a collaborative project delivery method using relational contract principles to harness all of the strengths and capabilities of the owner, designers, and constructors and focus them on one goal: the efficient delivery of the project as a whole. Successfully implemented, IPD can take separate, individual AEC companies (silos) and turn them into efficient functional teams with creative problem-solving abilities that far exceed the successes of DBB and DB. The participating team members (subcontractors) are usually selected by a team consisting of the owner, managing contractor, lead designers, and other IPD team members. In the more successful IPD projects, team members are not selected by bid price, but rather by their industry experience and their ability to function in a collaborative team environment. The selected team members start meeting from the inception of the project as the design begins.

The birth of the IPD process has been largely credited to Westbrook Construction, a 57-year-old mechanical construction company in Orlando, Fla. Westbrook was a DBB contractor that moved into DB but still kept looking for a better way to use the creative abilities of the whole AEC team, not just their own employees. Another organization, IPD, Inc., also of Orlando, began developing relational contract forms as a non-profit corporation that existed only during the project and then distributed all its profits to the IPD team members at the end of the project. The evolution of IPD continues, unabated, worldwide.

### Big IPD, Little IPD

IPD can be as elaborate or as simple as you desire. "Little IPD" consists of a team of designers and constructors meeting every so often to review 2D drawings. Collaboration occurs and designers and

constructors give each other valuable feedback. Design improvements are made based on collaboration. In Little IPD, all the team members might not necessarily meet at one time. There are sub-groups that meet at different times to discuss their own particular areas of expertise, mechanical, electrical, and plumbing (MEP) being a primary example. However, it is difficult to harness all the collaborative benefits of an MEP group without a good clash-detection method. This is where we move into “Big IPD.”

Big IPD brings in many more tools. The use of 3D modeling and building information modeling (BIM) is a foundation of Big IPD. BIM functions extremely well in a team environment because it fosters collaboration, the foundation of IPD. It allows remote team members to collaborate with the group from wherever they are located. Further, BIM’s clash-detection capability can help a project save huge amounts of time and money when it comes to construction, particularly in the reduction of clashes between MEP and structural systems.

Another cutting-edge project tool that is integral to IPD is Lean Construction (and its Target Value Design concept), thanks to its new way of looking at eliminating waste and costs. I was recently involved in an IPD

project that saved \$60 million dollars in design and projected construction costs in one year using Target Value Design methodology. (See the November 2008 issue of MSC for an article on this project, “Lean Construction in California Health Care,” and one on BIM, “Technical Solutions are Just the Half of It,” both available at [www.modernsteel.com](http://www.modernsteel.com).)

Can you build an IPD project without all of these tools? Sure you can, as is illustrated by Little IPD, which was implemented before the above tools came along (and still is). There is money to be saved using both Little IPD and Big IPD. However, design and construction team managers that have experienced both types will tell you that the more tools you learn the more fun the project becomes. And the desire to learn is an absolute must for anyone considering doing IPD.

### IPD Agreements

Now that you have a better idea of what IPD and its advantages are, you’re probably wondering how/where it exists on paper. One such document is ConsensusDOCS300, which was introduced in September, 2007 as an IPD relational form of agreement. ConsensusDOCS is an alliance of more than 20 AEC firms and organizations, including the Association of General Contractors (AGC), and is the first IPD delivery contract developed using IPD principles of collaboration and consensus. The basis of this agreement is collaboration and risk-sharing between parties. Since it was developed by industry participants, it takes a more “even-handed” approach and attempts to not to shift risk to any particular participant over another. It establishes a core group of owner, architect, and general contractor to be the overall management leadership of the IPD project. Last year, ConsensusDOCS released the ConsensusDOCS301 BIM addendum, which defines responsibilities and ownership in collaborative BIM sharing. (Visit [www.consensusdocs.org](http://www.consensusdocs.org) for more information).

Another IPD-related agreement was drafted by William A. Lichtig, a construction attorney with McDonough, Holland and Allen in Sacramento. The agreement is called “Integrated Form of Agreement” (IFOA) and is being used by Sutter Health on IPD health-care projects in California. The direct parties to the IFOA consist of the owner, architect, and GC and are known as the core group. This group is responsible for managing the process and makes decisions by consensus. Only when a consensus is not achievable does the decision default to

the owner. Subcontractors are called “trade partners” and are selected from proposals and interviews by the existing IPD team members, including other trade partners already selected for the team. Selections are not made by price but by level of experience, and more importantly, by the ability to work within an integrated collaborative team. The IFOA provides for the use of Lean Construction tools such as Target Value Design, continuous improvement, last planner (one contract form of IPD), and “tightly coupling learning with action.” (See “Integrated Agreement for Lean Project Delivery” in *Construction Lawyer*; it’s posted at [www.LeanConstruction.org](http://www.LeanConstruction.org).)

Another organization, the American Institute of Architects (AIA), published two forms of IPD contracts last year. The first, a single-purpose entity, is a full IPD agreement with a limited liability corporation; all parties sign one agreement. The second contract is called multiple-purpose and has the more traditional separate owner-architect and owner-contractor agreements as well as a general conditions. (AIA sees this second form as an easier transition from DBB to IPD for a contractor experiencing IPD for the first time. Since it is structured similarly to traditional agreements, it will be more familiar to contractor that uses the DBB method.) AIA has also published *Integrated Project Delivery: A Guide*, which is available to everyone for a free download from AIA’s web site. This document is an excellent overall guide to IPD. AIA’s website also has multiple informative Podcasts on IPD. (See [www.aia.org](http://www.aia.org).)

Finally, when public works accepts IPD, the conservative side of the business is signing on. In June of 2007, the state of Colorado passed a public law, 1342 “IPD Methods and Public Construction,” meant to adopt the cost-saving benefits of IPD into public construction. The bill provides statutory authority to all public and quasi-public entities in Colorado to use any IPD methods deemed appropriate for the award of contracts for public projects.

Construction project delivery methods have come a long way. The latest, IPD, promotes true collaboration between the team players and gets the right people involved at the right time: the beginning. While it is still a relatively young approach, it is a viable and increasingly implemented option, and one that you should become familiar with in order to stay competitive in the business of construction. MSC

*Dick Decker is a project manager with 25 years experience in construction management.*