

December, 2011

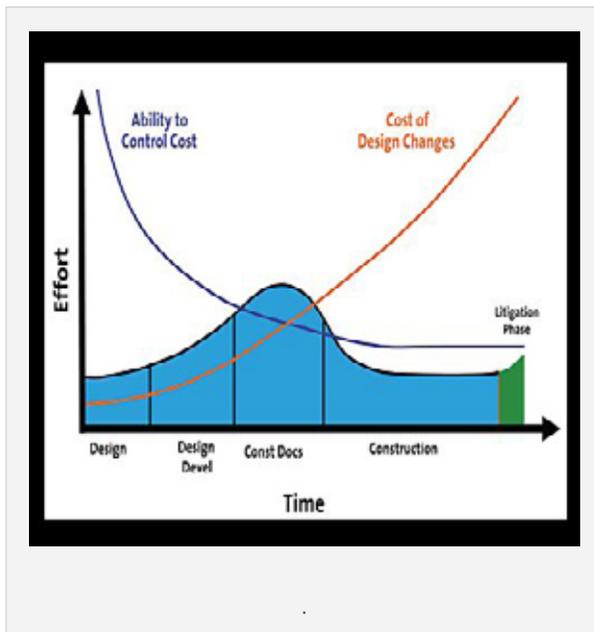
Innovative Construction Risk Strategies For Lean Economic Times

COMMENTARY: Integrated Project Delivery and The Cost Curve

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We've been talking about contracts for integrated project delivery since before the start of the Lesser Depression, since before Ben Bernanke was chair of the Federal Reserve; about when the Boston Red Sox won their last World Series. Yet, we've not



come very far in implementing its promises. How come? The initial hype promised nothing less than a revolution in efficiency and cost savings. For example,

the AIA's "Integrated Project Delivery: A Guide" (2007) tantalizingly proclaims: "The United Kingdom's Office of Government Commerce (UKOGC) estimated that savings of up to 30% in the cost of construction can be achieved where integrated teams promoted continuous improvement over a series of construction projects. UKOGC further estimates that single projects employing integrated supply teams can achieve savings of 2-10% in the cost of construction." This echoed an *Economist* article from 2000, also cited by the guide, which claimed that there is 30% waste in the US construction industry. If we can achieve such savings by adopting integrated project delivery, why isn't everyone doing it?

Fact is, we're not. Autodesk adopted IPD for construction of its new architecture, engineering and construction headquarters in Waltham, Massachusetts in 2008-2009. It was an exception. IPD is such a radical concept today, noted Phil Bernstein, Autodesk's vice president of building industry strategy & relations, that Autodesk's AEC HQ project was one of only about 10-15 "100-percent pure-play" IPD projects undertaken in the United States as of that time. Things have not changed. At the annual meeting of the ABA Forum on Construction Law in 2011, Howard Ashcraft, one of the foremost authorities on integrated project delivery in the United States, acknowledged that since then institutional owners have pulled back from IPD, insurance brokers are not hearing about it, and the industry, as a whole, is not much in the mood for innovation at this time. He noted that developers of heavy civil projects have concluded that IPD is not suitable for that industry segment.

To the extent that IPD is getting traction it is happening in healthcare. But even in healthcare, application of IPD is sparse. In San Francisco we currently have three new hospitals under construction, the \$1.7 billion Sutter California Pacific Medical Center (CPMC) on Cathedral Hill, the \$1.6 billion UCSF Mission Bay project, and the \$900,000 San Francisco General Hospital and Trauma Center. Of these, only the Sutter CPMC is being developed with IPD. Sutter is also developing a much smaller 88 bed medical center in Santa Rosa using IPD. There do not appear to be many other projects using full IPD at this time.

The Development and Benefits of IPD

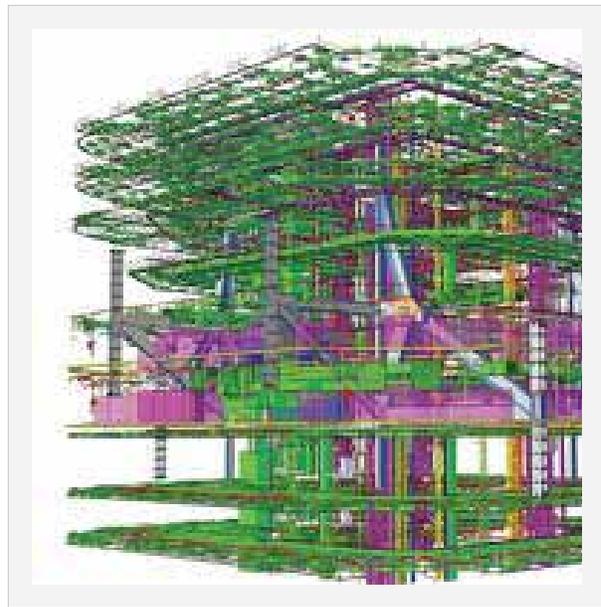
In August 1997, Greg Howell and Glenn Ballard started the Lean Construction Institute. Experienced in construction and organizational efficiency, they were looking for ways to incorporate into construction processes some of the lessons learned in making manufacturing more efficient. They studied principles of organization and processes developed by Toyota and others, and sought to apply concepts like just-in-time delivery, continuous process flow, “pull” supply chains, and a culture of stopping to fix problems. They promoted a need for leadership committed to these principles.

At the same time computer assisted design software developers, like Graphisoft, Bentley, Autocad, Navisworks, Data Design Systems, Nemetschek, and others were making great strides in developing ever more comprehensive computer models for use in building design, which have come to be known as Building Information Modeling (BIM). More than electronic lines that may project a design in three dimensions on a computer, BIM uses information rich databases that can integrate and characterize all aspects of a building. BIM can include material quantity and pricing information, life-cycle energy consumption information, as well as construction details. To the extent that this information is properly tied together in the model, coordination issues between different aspects of the drawing and specifications are greatly diminished. It makes the implementation of changes much easier. To the extent that all the databases are tied together, making one change in the model, like adding a door or moving a wall, automatically makes all related structural, architectural, and pricing changes in the model.

Organizational efficiency and BIM, of course, are not new project delivery models. Toyota production system ideas are management principles, and BIM is a tool. However, both of these developments in

construction emphasize collaboration and were largely responsible for the development of IPD. A full adoption of BIM necessarily blurs traditional legal lines and blends the traditional division of responsibility on projects. If the architect and design engineers work on a single model, subcontractors directly enter shop drawing information on that same model, the contractor inputs scheduling information, the owner adds life-cycle information, and all depend heavily on anonymous software engineers who are responsible for creating the model. Responsibility for the model is collectivized. It’s more of an “Occupy” than a “Tea Party” movement.

In 2005 Will Lichtig, an attorney now with Boldt Company, presented a paper entitled “Ten Key Decisions to a Successful Construction Project” at the ABA Forum Fall meeting in Toronto, Canada, which outlined the lean project management principles and advocated the use of an IPD contract. A new form of contract was required to fully take advantage of the promises of lean project management principles and BIM. In collaboration with the Lean Project Institute and Sutter Health, which was then on the threshold of a \$5.5 billion construction program, Lichtig developed an IPD form of contract. This form later served as the basis for the Consensus Docs 300 form of agreement for integrated project delivery. The AIA has developed its own form, and others, like



Howard Ashcraft at Hanson Bridgett in San Francisco have developed their own proprietary forms of IPD contracts. The parameters, complexity, and subtleties of these agreements have since been widely discussed, presented, and refined in many industry forums. Today, even though they are not widely used, IPD agreements

are well developed and many counsel are well versed in how to properly negotiate such agreements.

IPD agreements present a fundamental break from the way parties on construction projects have traditionally allocated risk. Agreements in traditional delivery systems like design-bid-build, multiple-prime contracting, construction management (in various guises), and design-build, strive to draw clear lines between the parties and their legal responsibilities, thus allocating the risks and rewards for each project participant as clearly as possible. Traditional contracting models thus make it possible to sort out who should pay the piper when projects are delayed and costs increase unexpectedly. It has been noted that this tends to naturally pit project participants against each other and that sorting out legal responsibility is expensive. When disputes do occur, matters are complicated by the fact that litigation outcomes are infamously uncertain. By contrast, IPD agreements blur responsibilities for the scope of work, and they shift the allocation of risk away from the courts to a no-fault sharing of cost overruns on a pre-determined basis.

The core of an IPD agreement is one agreement executed by the owner, the architect, and contractor. These parties are involved in the project earlier, and in the case of the owner and contractor, more actively than in traditional delivery models. The contractor and key subcontractors are actively involved during the design process. If BIM is used, they may provide input directly into the model during design development. The parties work together to establish appropriate target pricing early in the project, and this target pricing is constantly fine tuned and adjusted until such time as the architect, design consultants, contractor, key subcontractors have sufficient confidence in the pricing to put their fee or profit at risk relative to a firm target price. All, or a portion of the fee and profit from participating project participants are placed in a risk pool, which will be used to pay for any cost overruns. If the project is successfully completed for less than the agreed upon target pricing, then the agreement may provide that the risk pool may be increased. At the end of the project the risk pool (i.e. everyone's profit and fee) is distributed according to a pre-determined percentage that each party has as its share of the risk pool. As noted, the amount in the risk pool will depend on the success of the project. However, there is no maximum price. If project overruns have exhausted the amount placed in the risk pool, then the owner bears the risk of cost overruns in excess of that amount.

By collectivizing risk and rewards, the IPD agreement provides an incentive for team members to

work cooperatively in the best interest of maximizing overall project success. The parties throw their lot together into the same profit pool. Project participants are naturally drawn together, not set against each other, as in traditional risk allocation models. The no-fault concept permits parties to blur lines of responsibility. Contractors can freely roll up their sleeves and contribute to the design without fear of compromising their Spearin doctrine protection; similarly, architects can review shop drawings and field questions without fear of assuming increased risk. No one needs to worry about introducing inefficient defensive procedures for fear of unwittingly assuming project risk. Everybody benefits equally if the most efficient, best decision is made for the project; the need for "cover your behind" documentation is eliminated.

So Why Aren't There More IPD Projects?

Messianic fervor about IPD project delivery remains intact among many attorneys and consultants. Contractors like Boldt, Mortenson, and many others are investing heavily in BIM capability and stand ready to complete projects through IPD. Why are owners slow on the uptake?

One answer may be that, rumors to the contrary notwithstanding, owners are generally satisfied with the traditional delivery models. CM at risk with a guaranteed maximum price works well for most private owners. Design build can offer the same advantage of an accelerated development and construction timeframe as can be accomplished with IPD. There are many experienced and expert construction management firms, like Hill International, who have deep benches and are able to oversee and successfully implement projects using any number of traditional project delivery methods. Most projects are in fact successful in terms of meeting their budgets and schedules. Although attorneys and consultants in the claims trenches can lose track of this, most projects don't end up with claims that cannot be routinely resolved by project participants.

Another answer may be that owners are not yet sold that the advertised cost savings of IPD are real. The business case has not been fully made. Every project delivery choice leaves many paths not taken. It is impossible to know what the outcome would have been on one of those other paths. Because construction projects are unique, it is difficult to compare projects, and because project financial information is sensitive and most owners don't develop multiple projects in a current timeframe, cost metrics are not easily available in order to compare different (but similar) projects that have used different project delivery methods. If reliable

evidence develops that IPD in fact achieves significant cost savings on a consistent basis, attitudes will change.

However, there is one aspect of IPD that may in fact retard the widespread use of IPD over the long haul. In order for IPD to work best, it requires extensive involvement by all project participants from the earliest stages of the project. The greatest savings are achieved in getting the design right, and incorporating detailed efforts from the general contractor and key subcontractors during the design phase. This significantly shifts the cost curve to earlier in the project. For example, in Sutter's Cathedral Hill project the "big room," housing the architect, engineers, the contractor and many trade contractors has been in full operation for well in excess of a year. The monthly burn rate of this IPD team is very high. Developers generally are looking for ways to postpone the cost-curve on projects, not accelerate it.

It is not unheard of that projects are cancelled by developers after the design is finished. Market conditions can change adversely, making a project no longer profitable. Unforeseen conditions in an early part of a project may bring significant delays. Expected permits may not materialize when expected. In each of these scenarios, a developer would not be happy to have shifted the project cost curve into the design phase, as IPD requires.

In most CM-at-risk private developments, an owner may be able to secure considerable review and expertise from the contractor during the design phase even without IPD. Moreover, the contractor may significantly discount the cost of such review, or include the cost in the later construction cost. In either case, the owner benefits by shifting the cost curve later into the project. A quality construction management firm, like Hill International, can assist owners in evaluating how the cost curve shifts in a project depending on the delivery method used. The timing and magnitude of this shift may well tip the scales of which project delivery method is best.

Conclusion

IPD makes a lot of sense. It may improve project efficiencies and thus lower costs, although the metrics for such a prediction may not yet be accurate. As comparisons are made between projects like the three San Francisco hospital projects currently in development, owners will be able to make more informed decisions. In the meantime, when evaluating whether IPD is the right choice for your project, don't neglect to consider how the project delivery method shifts the cost curve.



Transitioning to Alternative Project Delivery

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Hill International



Given today's funding and resource constraints, public construction owners are increasingly turning to alternative project delivery (APD) methods to save time, reduce costs, encourage innovation, and deliver projects sooner. APD methods align the project participants around a set of common goals and foster collaboration which often translates to improved project performance.



If properly implemented, alternative delivery methods provide owners with powerful tools to motivate the contracting industry to meet project objectives. But APD is not a panacea. The decision to use an alternative delivery method should be made carefully and systematically, as these methods will fundamentally alter traditional roles and responsibilities, change risk allocation between owners and contractors, and create problems if not applied to appropriate projects or implemented in the right way.

Transitioning to alternative project delivery requires project staff to have the knowledge, skills, and experience needed to develop a realistic scope of work statement, to select a capable, qualified contractor, and to devise and implement a performance requirements that will ensure that the needs of the owner and other stakeholders will be met without stifling creativity and innovation, compromising the intended risk allocation

strategy, affecting value for money, or otherwise detracting from project goals.

Through an upcoming series of articles, we will discuss APD, and address some of the key implementation issues and lessons-learned that affect the successful implementation of alternative project delivery. These articles may include but are not limited to:

- **What are they?** Define and contrast various APD methods, discuss the rationale for their use, fundamental differences between APD and traditional project delivery, and how APD can affect various project delivery phases, from project planning and preliminary engineering through construction and possibly to operation and maintenance;
- **How to assess and manage risks** associated with alternative project delivery methods (e.g., bid protests, bonding issues, third parties, subcontractor relationships and limitations of liability), and what are the possible mitigation strategies?
- **What method to choose?** Identifying systematic approaches to choose an APD method most appropriate for a project considering project goals and characteristics;
- **What are procurement options?** Tailoring the procurement process to the chosen APD method to achieve a desired outcome; and
- **How to specify?** The role of performance specifications in allocating project risk and achieving project goals under APD.

Sidney Scott III, P.E., recently joined Hill's Construction Claims Group as a Senior Vice President. Scott has more than 25 years of experience in engineering and construction with a strong focus in transportation. He is a nationally-recognized expert in procurement and contracting methods for the construction industry, particularly in the areas of specifications for highway construction, design-build and innovative contracting. Scott has also researched and developed best practices for the planning, management, and administration for some of the nation's largest transportation projects. Scott earned his B.A. in anthropology from the University of Pennsylvania and his B.S. in civil engineering from the University of Delaware. He is a registered professional engineer in Pennsylvania and Delaware and is a past President of the Mid-Atlantic Chapter of the Design-Build Institute of America.