

# Integrated Design and Construction Industry Alliance

IDCIA – Journal – 0602

*Integrated Project Delivery, BIM, and the Future of Collaborative Design and Construction*

December 31, 2006

**Integrated Project Delivery, BIM, and the Future of Collaborative Design and Construction**  
Presented by  
**AIA San Francisco**  
& the  
**Integrated Design and Construction Industry Alliance**  
**Keynote Speaker**  
**Tony Rinella, Associate AIA**  
Technology In Architectural Practice Knowledge Community  
(The American Institute of Architects)  
**An AEC Panel Discussion**  
**Jim Bedrick, AIA**  
(VP, Virtual Building and Design, Webcor Builders)  
**Paul Audsley**  
(Corporate Manager, ACCO Engineered Systems)  
**Peggy Ho, PhD**  
(Visiting Fellow to GSA – San Francisco Bay Area)  
**Audience Q&A Discussion**  
3d virtual design technology, better communications through information sharing, just-in-time decision-making, breaking down old habits, risk-sharing, partnering and collaborative business relationships, balancing the process.  
**Sponsored by ARCHVISTA BUILDING TECHNOLOGIES**  
**Monday, November 20, 2006**  
**5:30 p.m. to 7:30 p.m.**  
**AIA San Francisco**  
130 Sutter Street, #600  
San Francisco, 94103  
Tel. 415-362-7397  
RSVP to [pbona@wlc-architects.com](mailto:pbona@wlc-architects.com) For More Information  
Contact Philip Bona at 510-815-2832  
(SOME REFRESHMENTS PROVIDED)  
AIA SF is two blocks from the Montgomery Street BART station and Market Muni stop.  
Parking is available at the Sutter-Stockton garage

## November 20, 2006 Discussion Group Notes

**Topic:** *Integrated Project Delivery, BIM, and the Future of Collaborative Design and Construction*

**Logistics:** November 20, 2006, 5:30pm – 8pm  
AIA San Francisco, 130 Sutter, SF

**Attendees:** See Attached Sign-in Sheet at Back

**Sponsors:** Archvista and Graphisoft

**Host:** Philip J. Bona, AIA WLC Architects  
510-815-2832, [pbona@wlc-architects.com](mailto:pbona@wlc-architects.com)  
& Margie O’Driscoll, AIA San Francisco

**Websites** [www.baucentrumarchitecture.com](http://www.baucentrumarchitecture.com)

**Resources:** <http://pbona.blogs.com/baucentrum/>  
[www.aiacc/ip.org](http://www.aiacc/ip.org)  
[www.aecbytes.com](http://www.aecbytes.com)

**Next IDCIA Meeting: February 22, 2007**  
San Jose, CA

**The following meeting notes summarize the significant points of discussion during our informative second meeting of the Bay Area’s Integrated Design and Construction Industry Alliance.**

### Host – Philip J. Bona, AIA WLC Architects

Mr. Bona, in his overview of the evening’s topics, presented the purpose of the IDCIA and the efforts being made by the American Institute of Architects (AIA), the Construction Users Roundtable (CURT) and the Association of General Contractors (AGC) to get the word out regarding the recent advances of Building Information Models (BIM) and what is being called Integrated Project Delivery. Setting the stage for the discussion, he showed an animation prepared from the model for El Cerrito High School by WLC Architects, as well as an animated project material sequencing schedule using the Virtual Model created for the Denver Art Museum by Mortensen Construction. Mr. Bona also contrasted that these tools are being used by small firms as well showing a house by Larry R. Barrow, Architect. He further stressed the importance in the future of individual skill sets and the experience that each of us can bring to the design and construction process.

### Keynote Speaker – Tony Rinella, Associate AIA CIO – Anshen & Allen Architects

Mr. Rinella discussed the AIA’s premise that this “CHANGE IS NOW.” He reviewed the past, present and future in the development of BIM and how it is being used to establish sound business strategies. He stated that this will bring substantive change to the industry reducing construction waste and increasing productivity through better communications, early collaboration between design and construction professionals, more accurate and proven construction representations using 3D virtual models and drawings, and the significant reduction of requests for information (RFI’s) and change orders. Expressing his own firm’s project successes, Mr. Rinella further laid the groundwork for the future of Integrated Project Delivery as a replacement of traditional Design/Bid/Build. He recognized that the world is more complex; projects are more complex; we have shorter timelines for projects; and, we have more cost-constraints.

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## **BIM Software Vendor Sponsor Comments:**

### **Tom Simmons, ARCHVISTA**

Mr. Simmons, described Graphisoft's ArchiCAD and their updated "Constructor 5D" product. He briefly demonstrated the ease of design and production of the building model and clash detection using the Navis Works software. He stated that using IFC – BIM software contributes to collaborative process throughout design, construction and maintenance of building regardless of which software is being used and which consultant you're working with.

***"We must learn new ways to do our projects. BIM is merely the vehicle to get us to great architecture more efficiently and cost effectively."***

## **Panelists:**

### **Tony Rinella, AIA – Anshen+Allen (Architecture)**

Mr. Rinella described an experiment his firm did in 2005. Anshen+Allen designed a project with two teams running in parallel: the traditional way, and using BIM. The BIM team reached similar conclusions about design elements (e.g. the sunshade elements over the window walls) and produced cost estimates in a few days compared to a few weeks by the traditional team. "Collaboration success", he said, "depends on who is in the room and how much you trust them."

### **Jim Bedrick, AIA – Webcor (Construction)**

Webcor, mostly due to Mr. Bedrick's contributions, is fully invested in BIM and frequently utilizes an integrated project delivery process. While trained as an architect and licensed to practice, Mr. Bedrick has brought his expertise in the design process and technology to this large and growing construction company. The company has focused mostly on negotiated project contracts which are well suited for integrated project delivery. He discussed the importance of cost and time management to a construction enterprise and reviewed the opportunities they have developed by taking the CAD files from the architects and redrawing them using 3D ArchiCAD. In doing so, they easily evaluate mobilization, staging, delivery and erection sequencing, and then give their BIM files to the steel, mechanical and electrical subcontractors to directly fabricate their assemblies and systems. RFI's have been slashed generally to dozens rather than hundreds for a typical approach. He further described a project Webcor is doing with Anshen+Allen and their engineering consultants using IFC software to translate the various 3D system models and make them compatible to be able to conflict checking between disciplines prior to actual fabrication.

### **Paul Audsley, ACCO (M/P Engineering Subcontractor)**

ACCO has been using BIM on Mechanical and Plumbing systems projects from almost a decade with tremendous success. Similar to Webcor, they take the CAD files from the engineers and architects and redraw them using 3D software. Generally they find conflicts between the architects and engineers drawings and by collaborating during the shop drawing phase or earlier, they resolve the conflicts prior to fabricating all their duct and piping runs in the shop. They also easily evaluate the staging, delivery and assembly sequencing in coordination with the other structural system installers. This process has almost eliminated RFI's and change orders after the start of construction. Mr. Audsley believes that design professionals have become undervalued and underutilized as a result of the litigious world of construction and that this new process will bring about a long needed change in the industry.

### **Peggy Ho, PhD. Candidate at Stanford University and Federal General Services Administration Visiting Fellow (Owner)**

Ms. Ho described her observations of the use of 3D virtual modeling in the design and construction process while with the GSA. She indicated that GSA mandated the full implementation of BIM on all future projects starting January 2006 but that the design and construction industries were willing to accommodate the demand so soon. GSA modified the mandate to only require 3D modeling for the schematic design phase of projects for at least another year. Only the industry's ability to step up will move the process along more quickly.

***"This new process is about just in time decision-making, collaborative project alliances, audited cost containment, and risk sharing."***

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**“...facilities managers, end users, contractors and suppliers are all involved right at the start of the design process.”**

## **Audience Questions to the Panel**

Q. What is the greatest obstacle in implementing BIM?

A: *Changing staff perception to understand the value of thinking, designing, and detailing in 3D. Also, there are benefits to the industry in embedding real useful data into each drawing object. Whether a design professional, contractor, owner, or regulatory agency, as members of this American society we all have preconceptions and a natural resistance to change. Better collaboration and communication seems more difficult to achieve. Trusting and truly collaborating on business decisions will take time. If we all take on a new culture of seeking out technology and even participate in beta testing of software, it will help to move the process along.*

Q. What is the Relationship to Design/Build?

A: *Integrated project delivery has similarities to Design/Build and is perhaps what Design/Build should have become. As Design/Build evolved it has become differentiated as “contractor led” or architect led, and in each case is exclusionary and sets the premise that either the contractor or the architect is in control of the process. Integrated project delivery is a collaborative effort that is formally facilitated and all participants are held mutually accountable for success or failure of the enterprise.*

Q. How do contractors feel about this?

A: *It depends upon the company’s feelings about technology in general and also the individual’s ability to trust and equally depend on the integrity of design professionals and owners. They must realize that the private sector is turning away from the traditional Design/Bid/Build method of procurement because it is inherently confrontational, wasteful, and litigious.*

Q. How will contracts catch up to this new process?

A: *Unfortunately, the 2007 issue of the AIA contract documents have not kept pace with the development of BIM or the need to capture the workings and relationships established within integrated project delivery. While there is a standard 10 year cycle between iterations of AIA contracts, it is likely that an interim contract document release will take place.*

Q. How will the regulatory agencies become involved?

A: *For over a decade a handful of California City Building Departments have offered some level of online applications for building permit and electronic plan submittals for private sector projects. Within the past 4 years the California Division of the State Architect (DSA) has also begun soliciting and receiving online applications for plan review and electronic drawing submittals for all state-regulated public sector projects under 100 sheets of drawings or less than \$10 million. The State Department of General Services agencies are all embracing the use of advanced technology and software. They are also looking at the work being done in Singapore in developing code analysis and conflict resolution software as a query system that would analyze the 3D model; much like “spellchecker” would check a letter. With the International Building Code (IBC) being adopted in California in the next year, it is possible that the IBC could be translated into an analysis software that simply code checks the model at each milestone and submits a report of code compliance directly to the governing agency.*

Q. What about the Architect as ‘Lead Dog’?

A: *Ultimately the Architect will continue to be responsible for accuracy of the documents and the model. With strengthened contract language using relationships and participant defined success through Project Alliance opportunities, Architects can be freer to design and bring about unique solutions that are cost effective with the use of mass customization. Due to their training, Architects can see the big picture and integrate the details more readily than other industry participants so the opportunity to regain the place of master builder is not lost. However, the historic master builder succeeded due to his close collaboration with his tradesmen and clients. It will be much more important for the Architect to understand risk vs. the value of design. Someone needs to lead; it can be the architect, the owner, the contractor or a facilitator. It will be collaboration for success and Architects can make the process more efficient using 3D techniques with all participants.*

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**The goal is that each participant will start out defining success for themselves and for the project and then all stakeholders will commit to working diligently towards the collective successes. This is an opportunity for a higher quality of life and balance with work.**

## NOVEMBER 20, 2006 LIST OF ATTENDEE & RSVP

			0	A	E	C	V
1	Adam Murphy	Beverly Prior Architects		A			
2	Ahmet Citipitioglu	SGH Engineers			E		
3	Atul Khanzode	DPR Construction, Inc.				C	
4	Baris Lostuvali	Swinerton Construction				C	
5	Benjamin Levi			A			
6	Boris Lostuvali			A			
7	Bradford McCurdy			A			
8	Bruce Bradsby			A			
9	Bruce Prescott	Santos Prescott		A			
10	Carlos Almeida			A			
11	Carlos Chang, S.E. LEED AP	Middlebrook+Louie, Struct.Eng.			E		
12	Catherine Nilmeyer	Nilmeyer Nilmeyer		A			
13	Chad Hamilton	Hamilton+Aitken		A			
14	Chris Krahn			A			
15	Clark Manus	Heller Manus		A			
16	Cord Struckmann			A			
17	Courtney Miller	Ecobuild		A			
18	Dale Krahn	Bunton Clifford		A			
19	David Howard	Syn Mechanical				C	
20	David Maino	IDEAS		A			
21	David Yee			A			
22	Dean Reed	DPR Construction, Inc.				C	
23	Dennis O'Neill	Architectural Practices		A			
24	Douglas Smith	SOM		A			
25	E. Kneer	Degenkolb Engineers			E		
26	Eric Kneer			A			
27	Evelyn Cruz	BPS Inc.					V
28	Fred Schreck			A			
29	Harvey Wong			A			
30	Jacob Wong	WLC Architects		A			
31	James Robertson			A			
32	Janna Stacey	Blach Construction				C	
33	Jason Pierce	Field Paoli		A			
34	Jim Bedrick	Webcor Construction				C	
35	Jim Fitzwater	Sugimura		A			
36	John Tillotson			A			
37	Johnston, Bobby	Perkins+Will		A			
38	Jose Hernandez			A			
39	Joy S. Wong,	Fong and Chan Architects		A			
40	K. Coscia	Degenkolb Engineers			E		
41	Kent Brown			A			
42	Kevin Norman	DES A+E		A			
43	Krista Nelson			A			

(0 = Owner; A = Architect; E = Engineer; C = Constructor; V = Software Vendor; V = Other)

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## NOVEMBER 20, 2006 LIST OF ATTENDEE & RSVP - continued

			0	A	E	C	V
44	L. Perez	Pankow Construction				C	
45	Luis Renez			A			
46	Mario Guttman	HOK		A			
47	Mark Hallock	Beverly Prior Architects		A			
48	Marvin Johnson			A			
49	Melanie Bonn			A			
50	Monique Wood			A			
51	Nathan Reasons	Form 4		A			
52	Patty Phan			A			
53	Paul Audsley	ACCO			E		
54	Peggy Ho	GSA	O				
55	Phil Williams	Webcor Construction				C	
56	Philip Bona	WLC Architects		A			
57	Philip Buscem			A			
58	Phoebe Lam	Field Paoli		A			
59	Rachel Del Fierro	Bunton Clifford		A			
60	Rebecca Evans			A			
61	Renata Abma	EHDD		A			
62	Rick Miller			A			
63	Rietta McCain			A			
64	Robert Ladden			A			
65	Robert Ludden	KMD		A			
66	Robert Sampson	DES A+E		A			
67	Robert Sauvageau	RYS Architects		A			
68	Ron Bishop			A			
69	Scott Peterson	DES A+E		A			
70	Steve Krapek	Sugimura		A			
71	Steven Wong	Field Paoli		A			
72	Suk-king Yiu	HOK		A			
73	Susan Aitken	Hamilton+Aitken		A			
74	Tai-Ran Tseng			A			
75	Thomas M. Simmons	Archvista		V			
76	Thomas Whisker	Beverly Prior Architects		A			
77	Tim Graf			A			
78	Tom Parrish	DES A+E		A			
79	Tony Rinella	Anshen + Allen		A			
80	Tracy Wong	DES A+E		A			
81	Vince Avallone	Chong   Partners Architecture		A			
82	Zigmund Rubel	Anshen + Allen		A			

(O = Owner; A = Architect; E = Engineer; C = Constructor; V = Software Vendor; X = Other)

***"So we can all see the potential that the technology brings but what this needs to be about is achieving extraordinary outcomes; outcomes that are based on a healthier design and construction enterprise that benefits all of its stakeholders in a fair, respectful, collaborative and cooperative way."***

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After the November 20, 2006 event, the audience wrote down thoughts (taken from the event evaluation forms) for future IDCIA discussion group events.

## Topics for discussion in future IDCIA Discussion Groups:

- **Using IPD & BIM on public projects like K-12 school s or small civic projects where general contractors are not on board until bid.**
- **Small firms successfully using BIM. How have they worked with consultants when they aren't large enough to drive them to change?**
- **More information of about the future of contracts.**
- **More information about the integration of structural, HVAC, plumbing, acoustical and electrical in the utilization of the model and the embedded knowledge that it contains.**
- **How to link "engineered" systems to the subcontractor that is downloadable plasma compatible data?**
- **How does the owner utilize the model as a facilities management tool?**
- **Show us actual dollar figures that demonstrate savings on completed projects using BIM.**
- **How will BIM advance idea generation and innovation; the front end of design?**
- **Show us a holistic BIM where design fabrication construction and communication all come together.**
- **Show us a benchmark comparison of the various 3D software.**
- **How does a small contractor break into this BIM integrated practice approach?**

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**Till next time, seek success through trust and true collaboration with all your partners.**

Respectfully submitted by Philip J. Bona, AIA