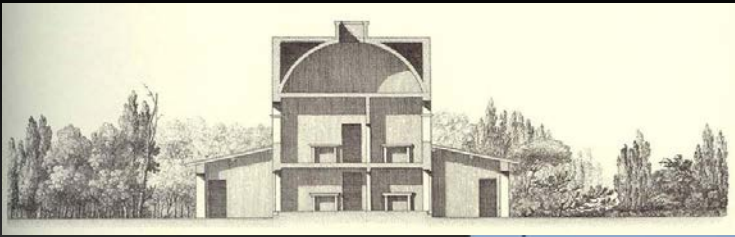


See what's
out
there.



Right here.

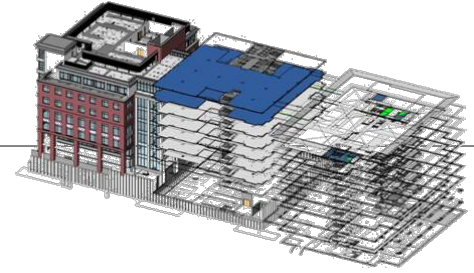
autodesk



Building Lifecycle Management: Driving the Future of the Building Industry

Phillip G. Bernstein FAIA
VP - Building Solutions Division

Key Themes



- **Coordination:** Eliminate errors & omissions
- **Time:** Increase efficiency
- **Delivery:** Enable new ways of working
- **Profit:** Create new fee opportunities

Waste: A Source of Opportunity

Inefficiencies, mistakes and delays account for \$200 billion of the \$650 billion spent on construction in America every year.

New wiring, The Economist, January 13th, 2000

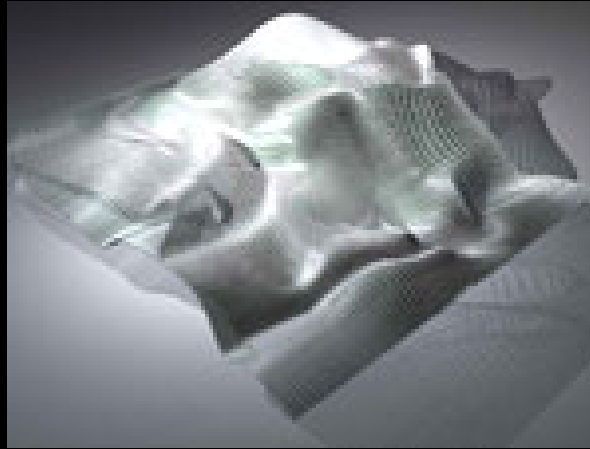
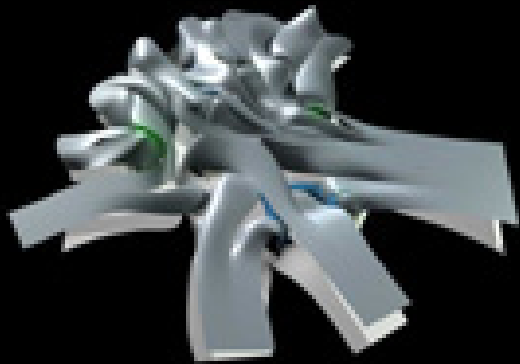
In the UK alone, the annual cost of rectifying construction defects caused by poorly detailed drawings and operatives being given incorrect instructions has been put at a £1bn (\approx \$1.66bn).

IT Construction Best Practice service, <http://www.itcbp.org.uk>

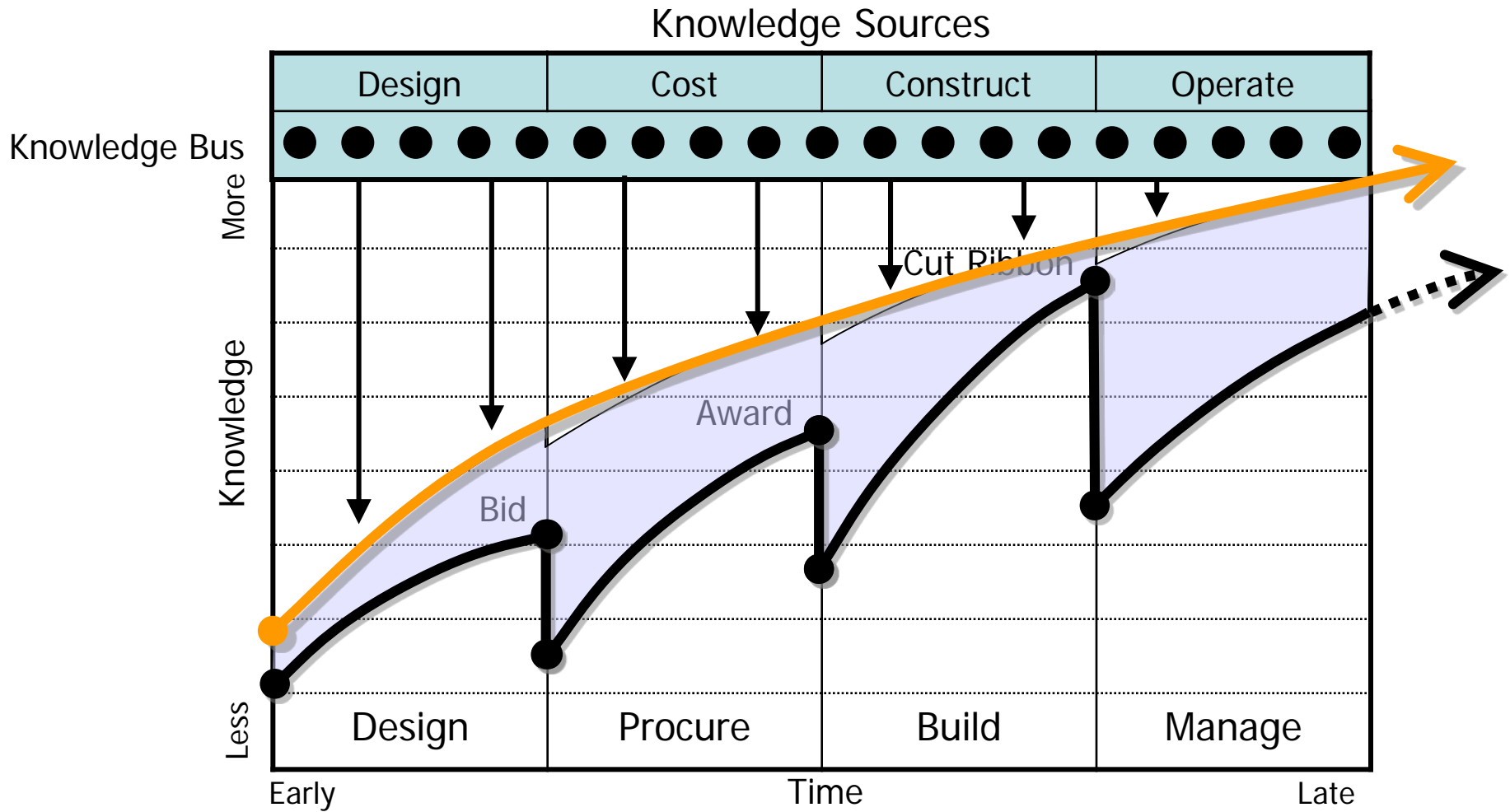
The process of construction is itself repeated in its essentials from project to project. Indeed, research suggests that up to 80% of inputs into buildings are repeated.

M4i, <http://www.m4i.org.uk>

Technology Investments & Explorations

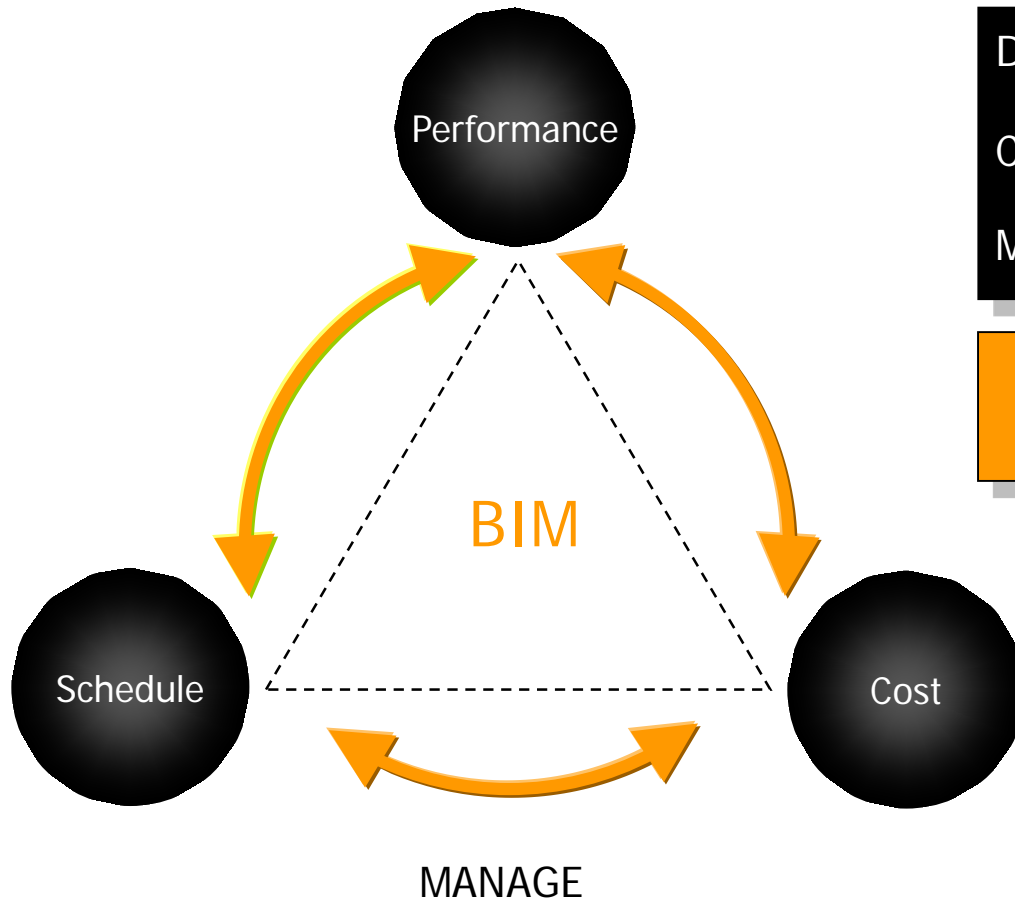


Information "Backflow"



Building Information Modeling

The Value of Relationships

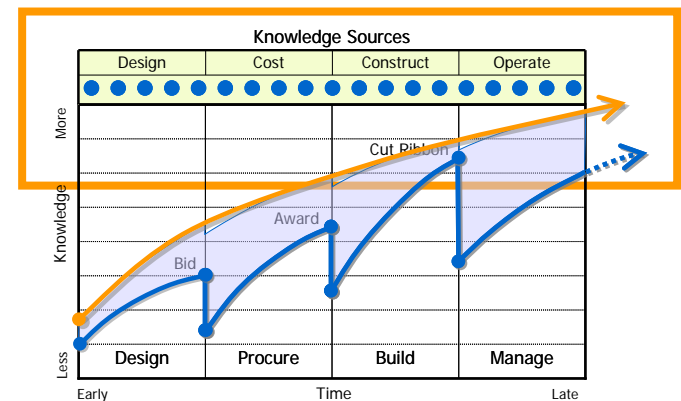


Design: Design Scope, Schedule, Cost

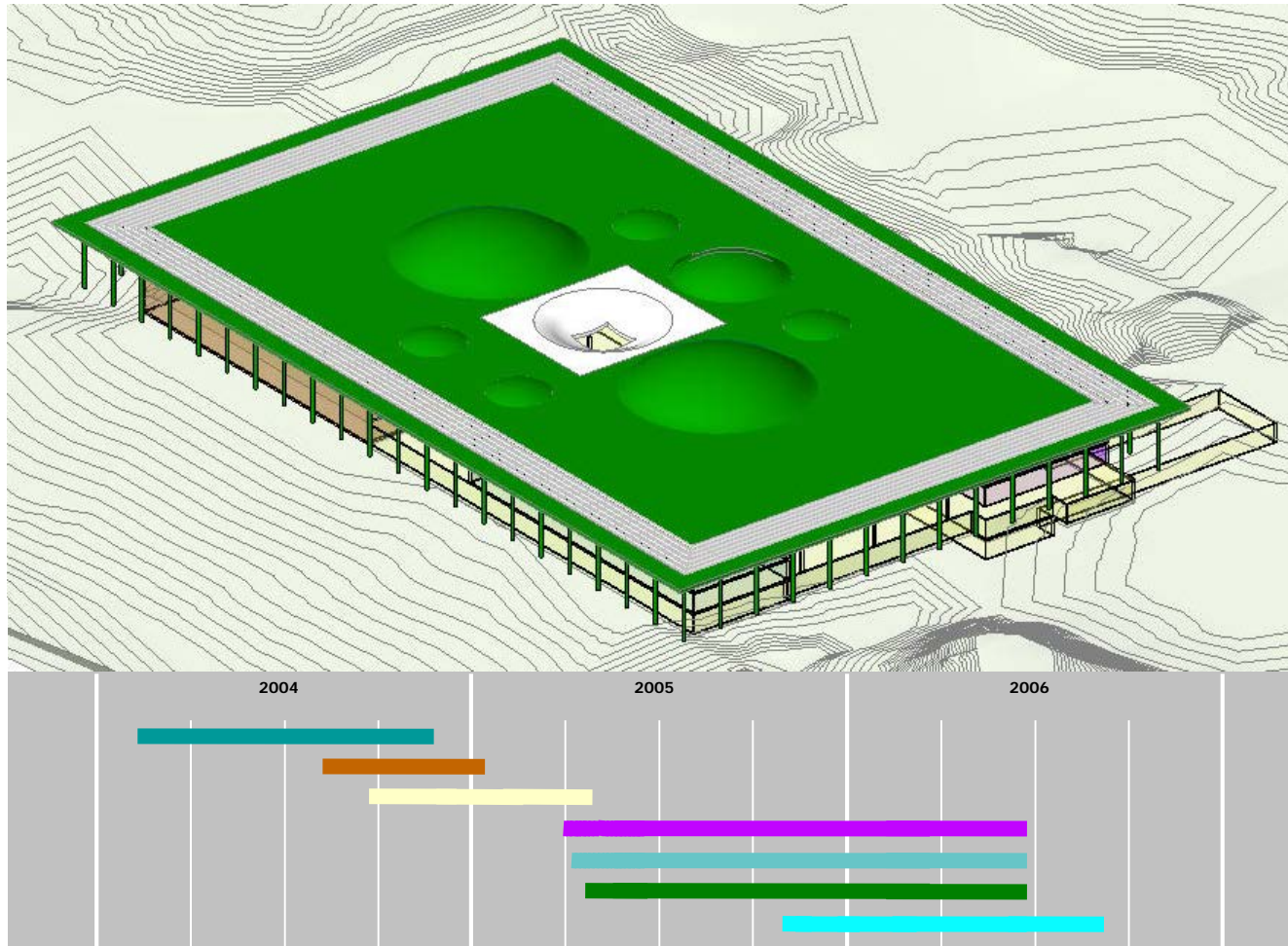
Construct: Quality, Schedule, Cost

Manage: Performance, Schedule, Cost

Integrated, Coordinated Database (Geometry + Data)



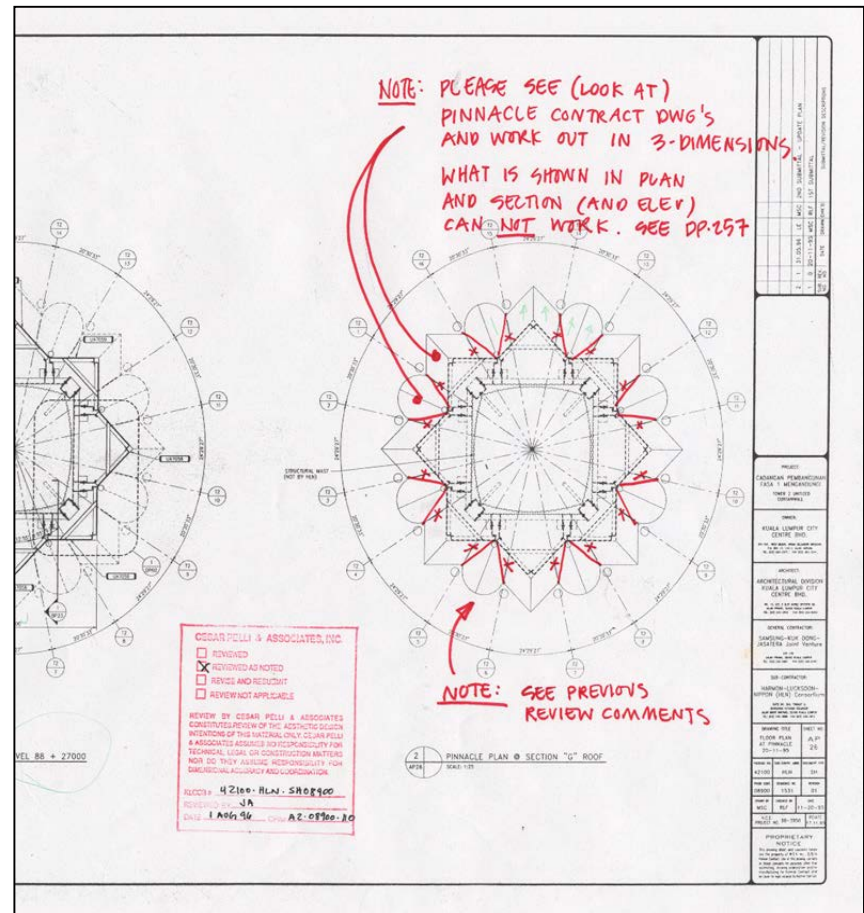
BLM: Creating Opportunities



Webcore Builders, Inc.

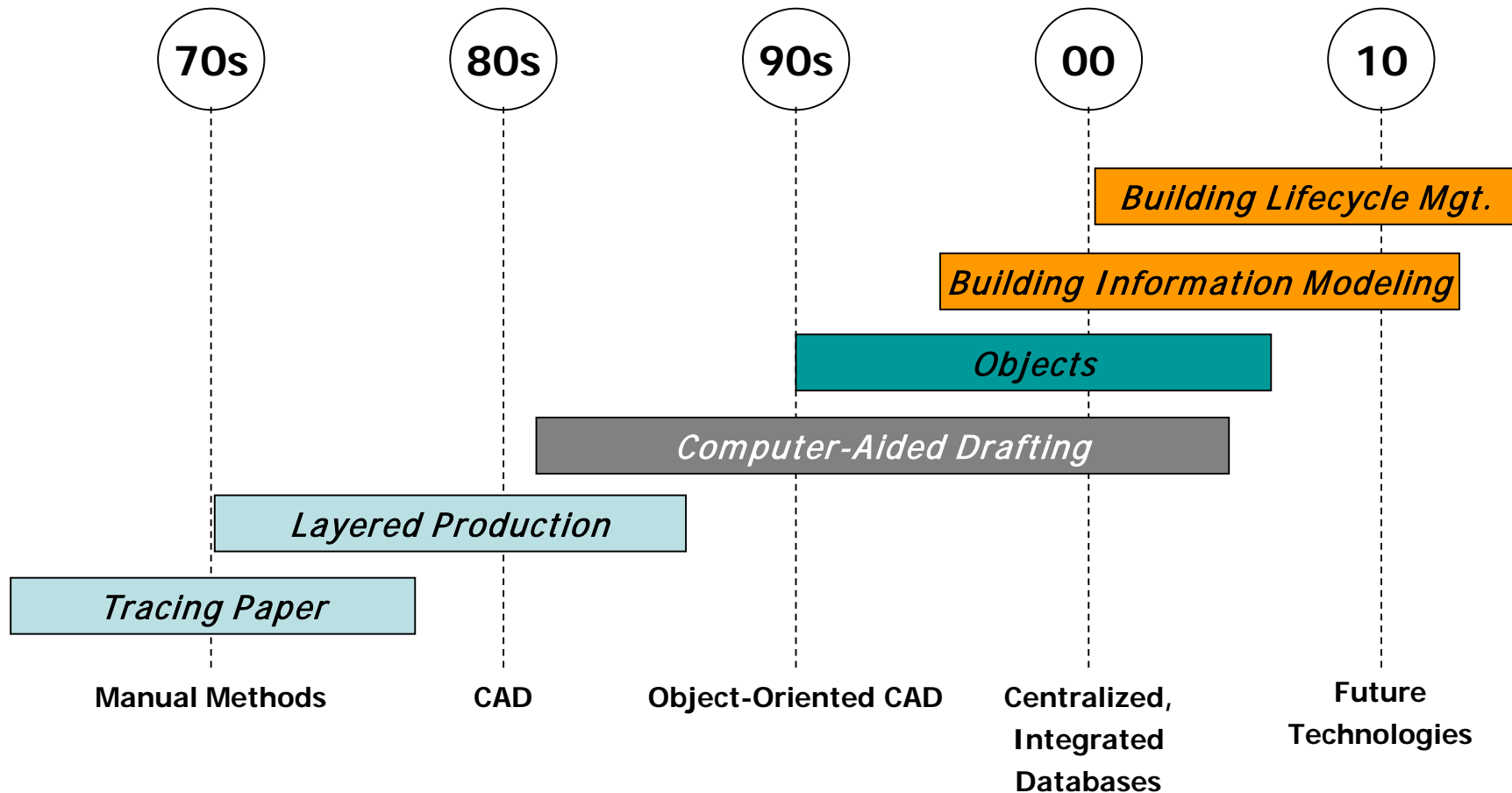
Technology can Eliminate Waste

- Rework
- Wasted labor effort, wasted materials
- Sources of mistakes costing \$US200B
- Reinventing project standards and data

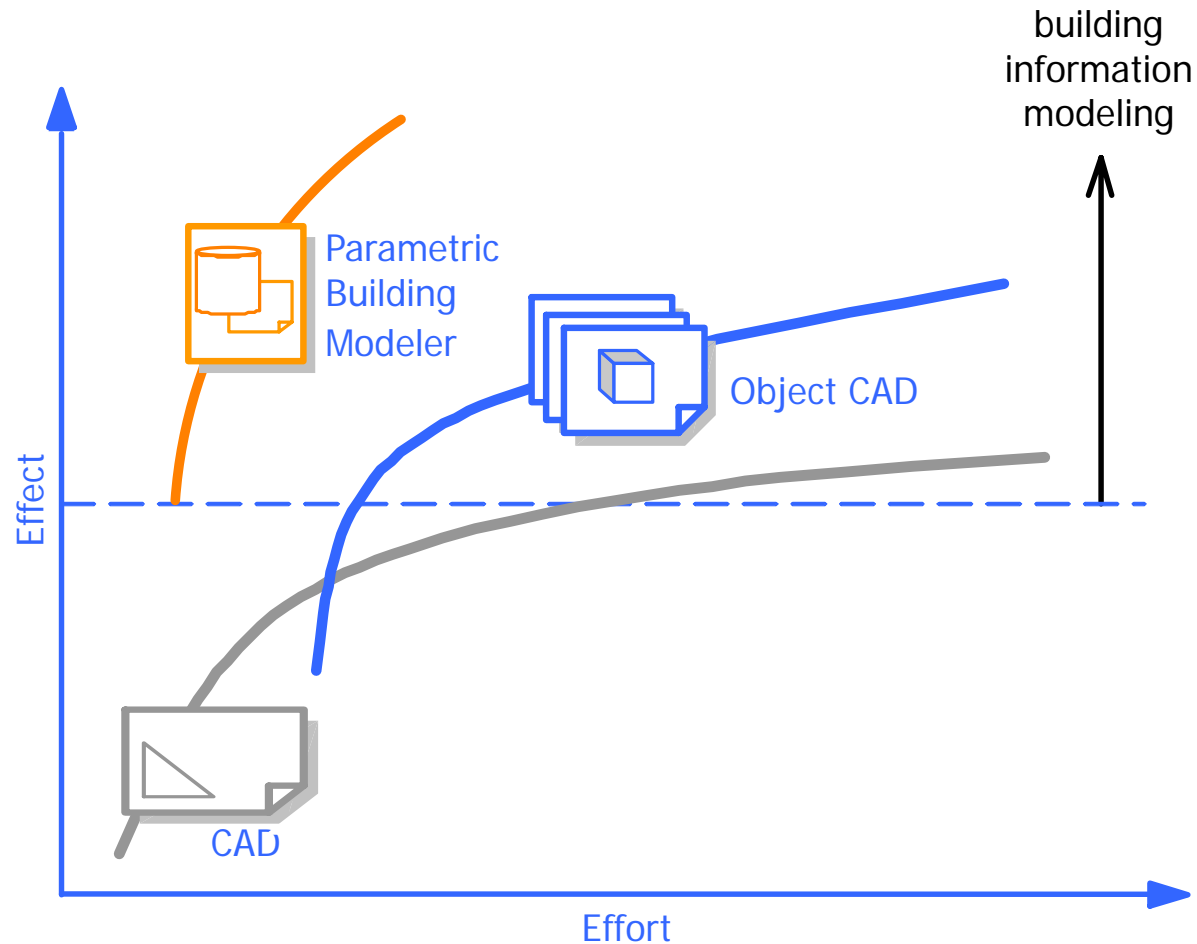


History of Methods of Production

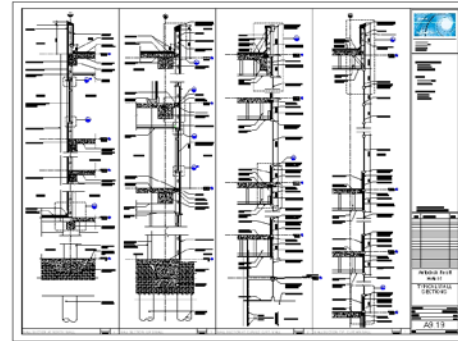
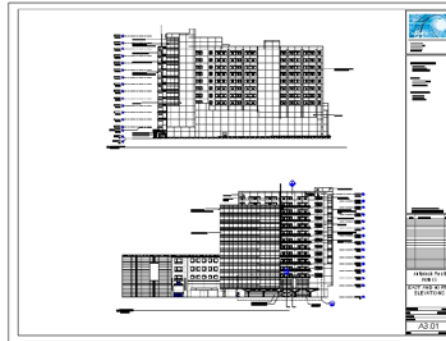
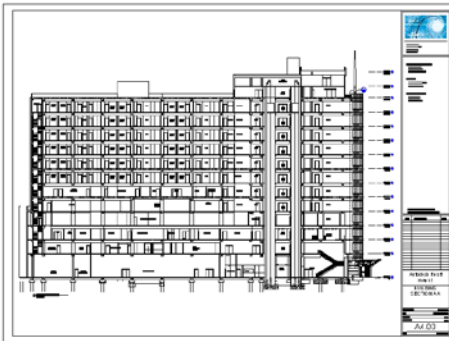
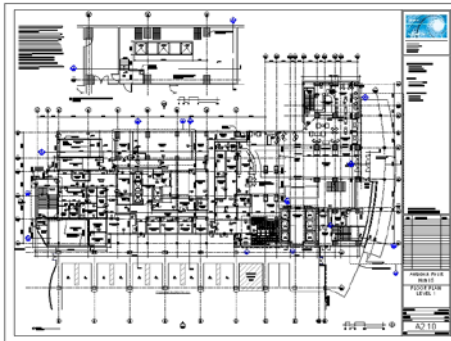
"You can see the computer age everywhere but in the productivity statistics." - **Robert Solow, MIT Economist, 1987**



BIM Evolution: Effort and Effect



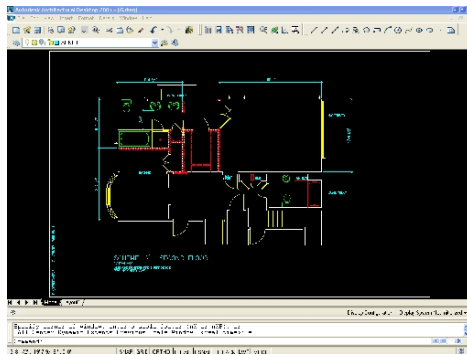
Technology Evolution



Graphics



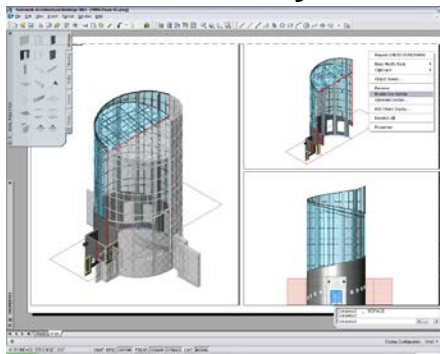
AutoCAD



Objects



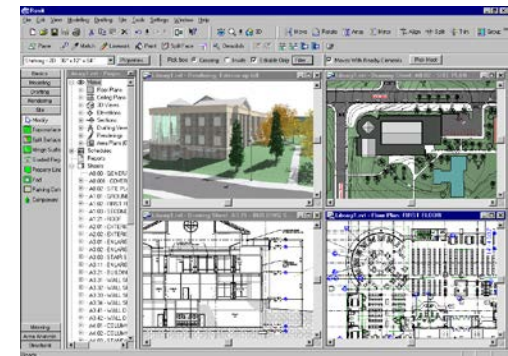
**Architectural Desktop
Building Systems**



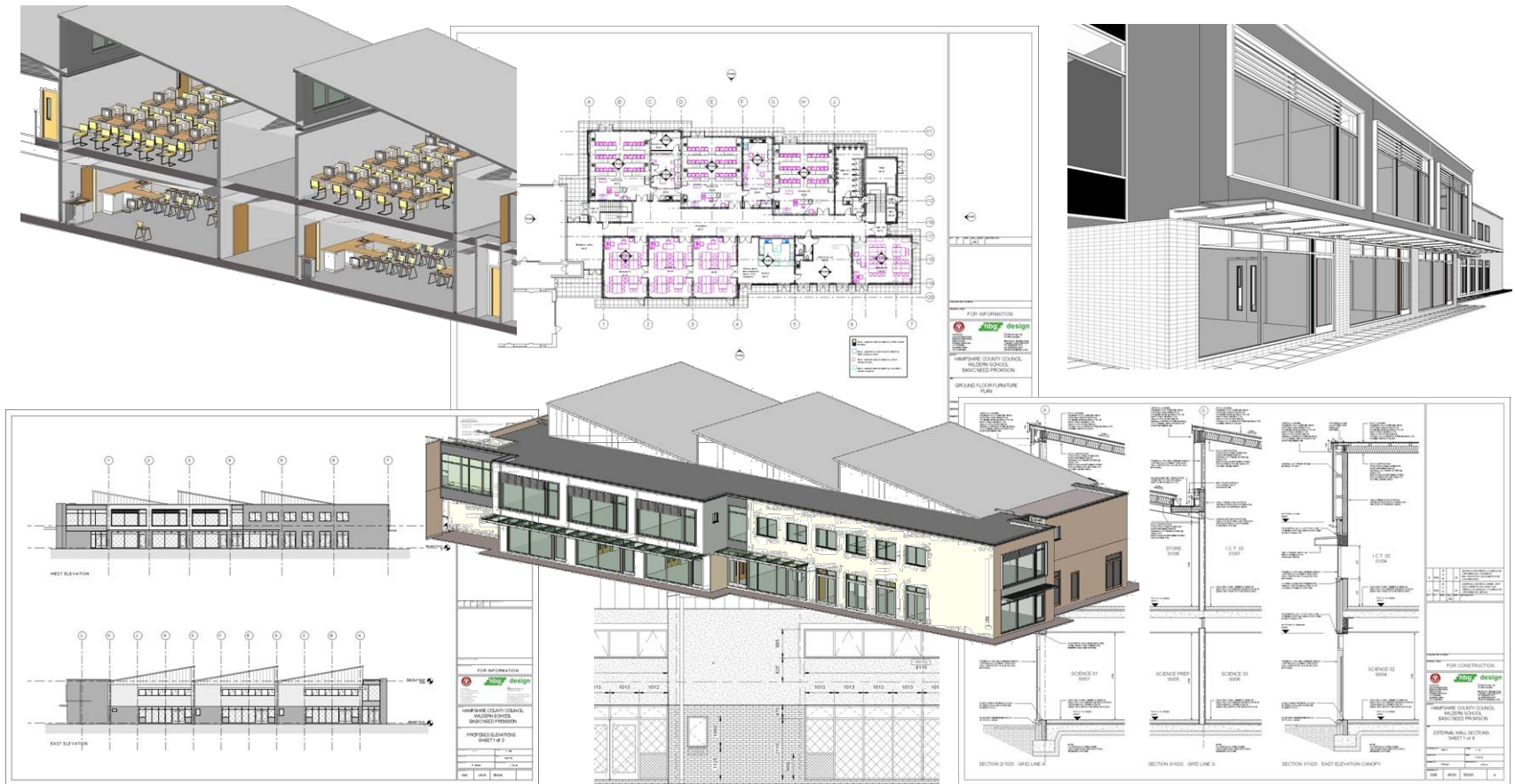
Parametric Building Model



Revit



Moving to BIM



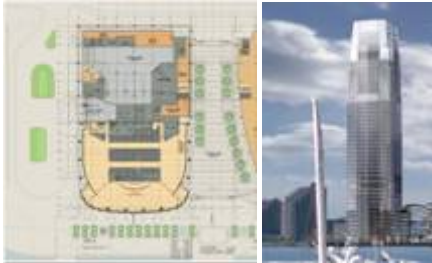
Images Courtesy of HBG Construction, London

Islands of Automation and Openness

Design

Build

Manage



Application

DWG

Application

DGN

Application

RVT

ODBC

Application

IFC

Application

DXF

Application

DGN

API

Application

DWF

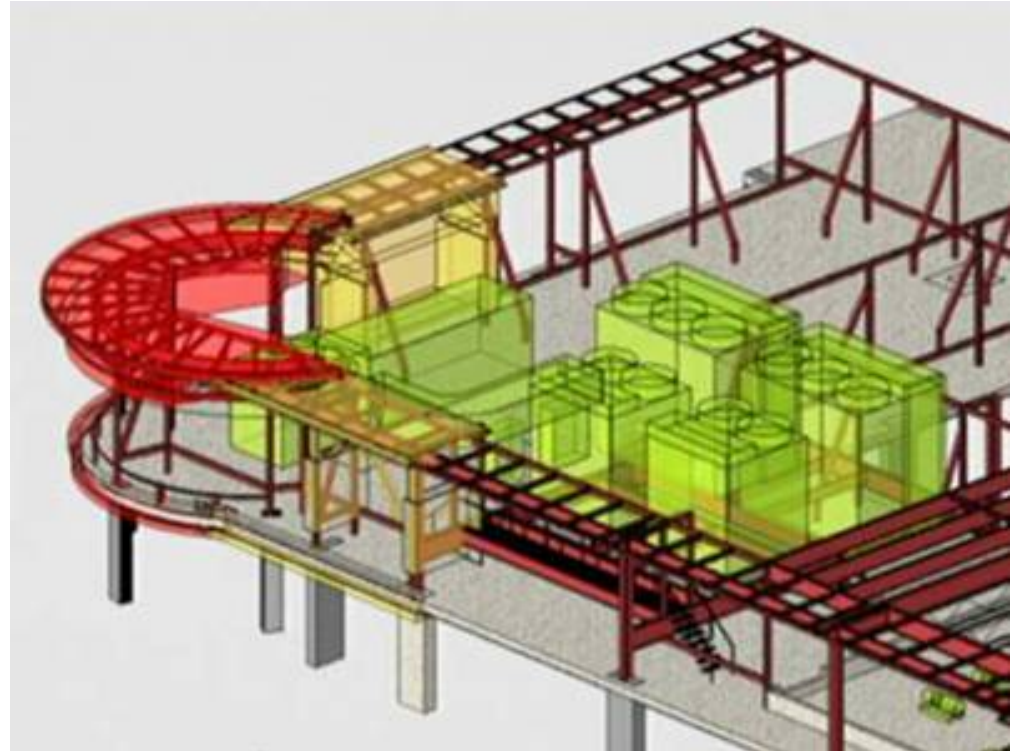
Application

xml

Application

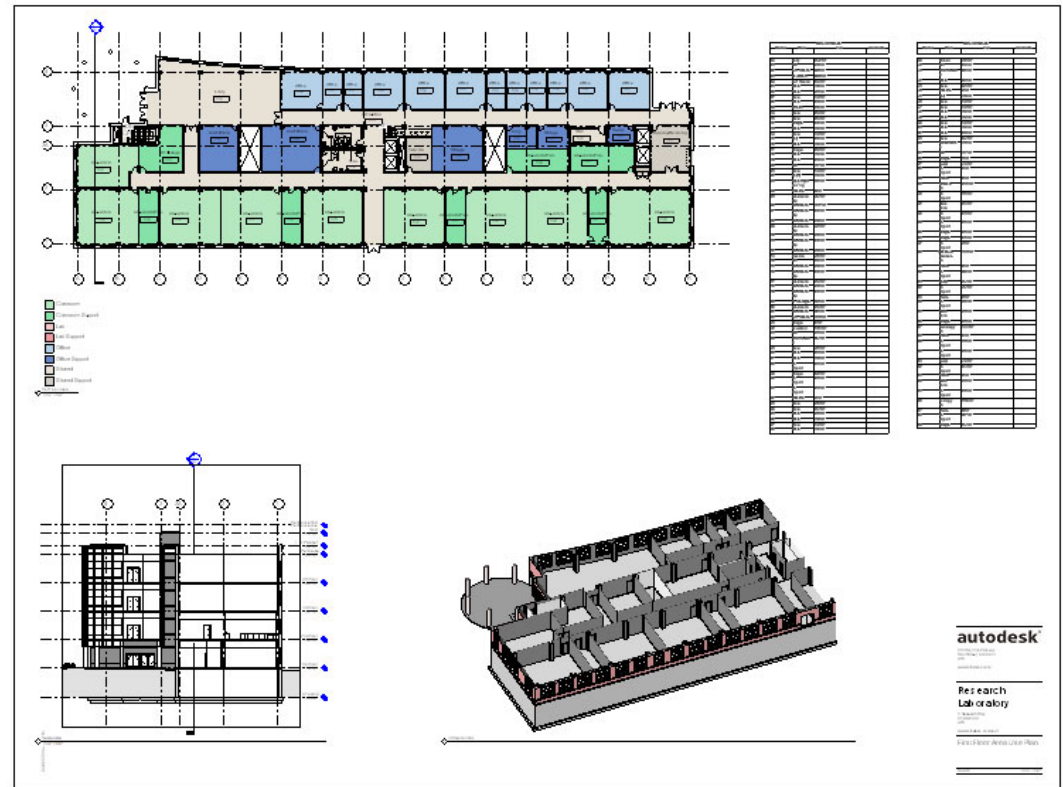
Trend: Coordination

- Errors are expensive
- The S/O/C is changing
- Expectations are increasing
- Business models aren't keeping up



Coordination: The Value of BIM

- **Building information modeling:**
 - Makes error-free documents possible by **eliminating coordination mistakes**
 - Helps you **win more repeat business**



Coordination: Antunovich Associates

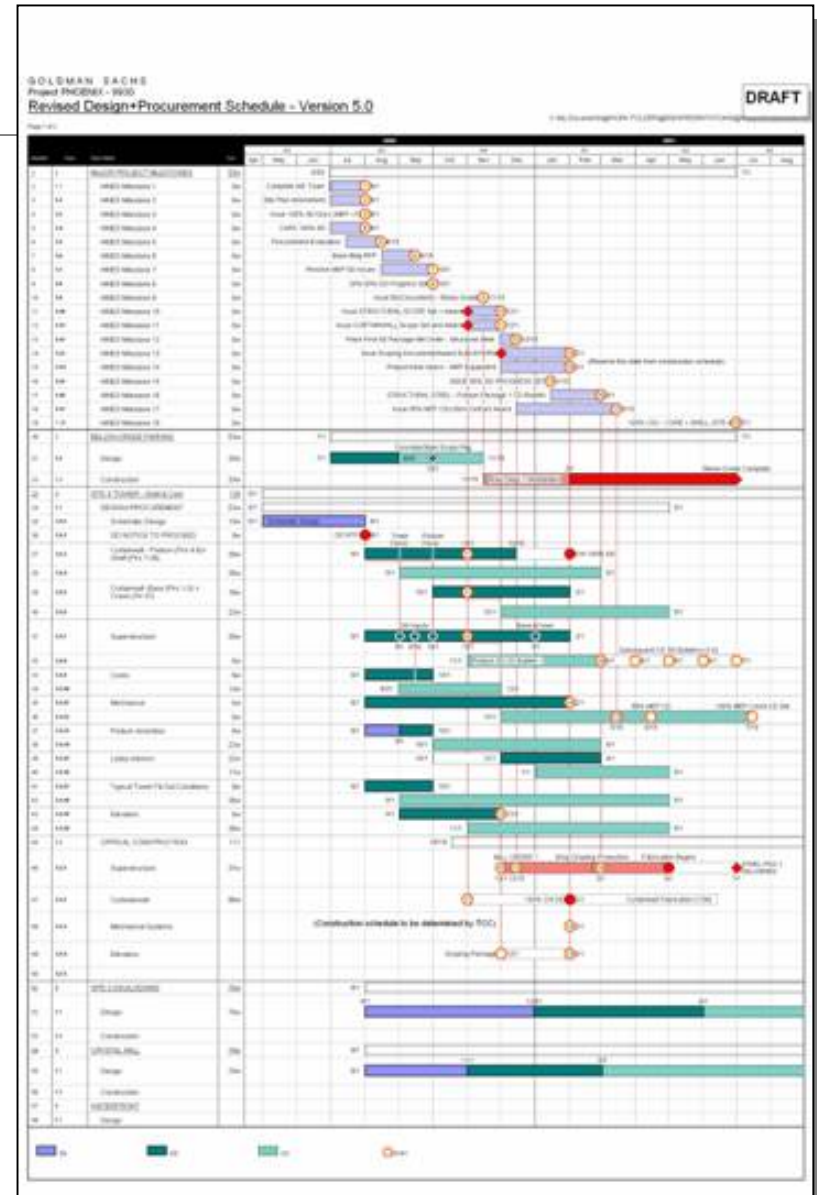
"The University Center Project of Chicago is a very, very unique collaboration of three Chicago institutions. This is the largest venture of its kind ever attempted."

Joe Antunovich, President,
Antunovich Associates



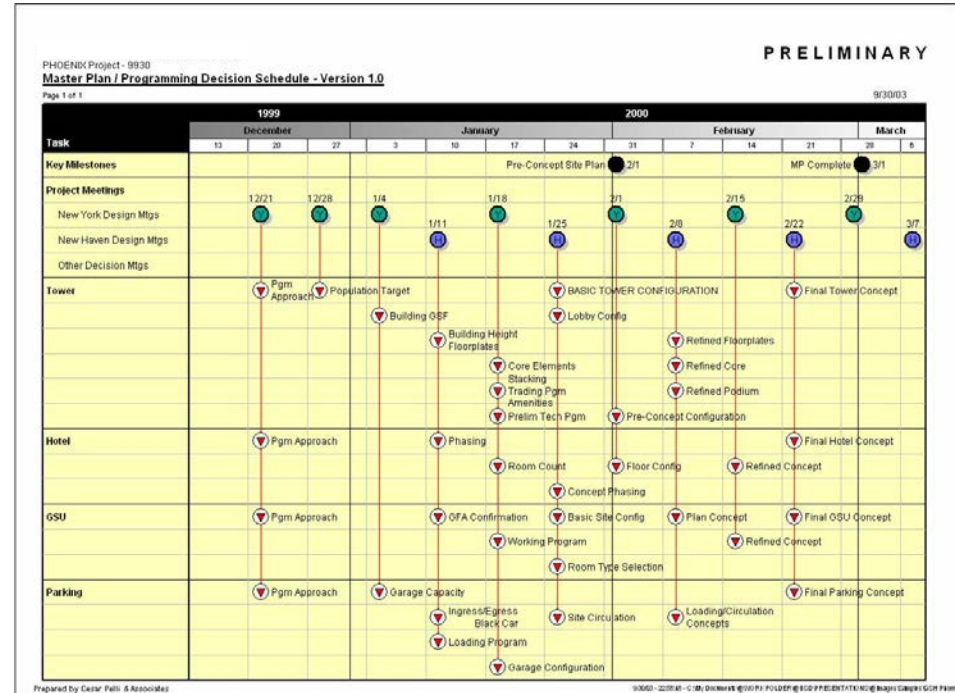
Trend: Time

- Shorter schedules
- Tighter fees
- More precise documents
- Faster turn-around

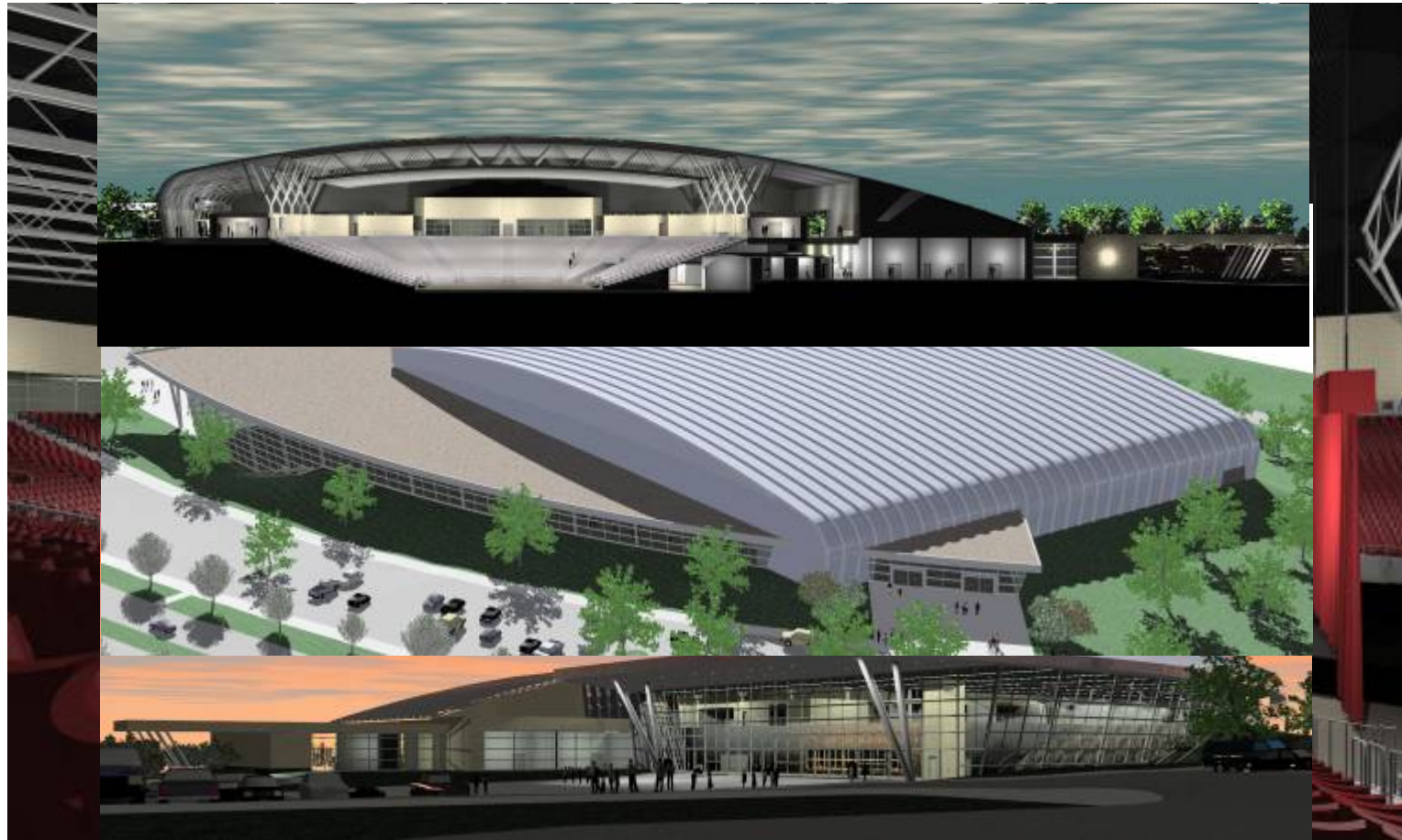


Time: Value of Building Information Modeling

- Allows **better understanding of project earlier**:
 - Improved communication
 - Cost estimating
 - In-process analysis
- Allows design and higher quality documentation to be completed **in less time**



Time: HKS

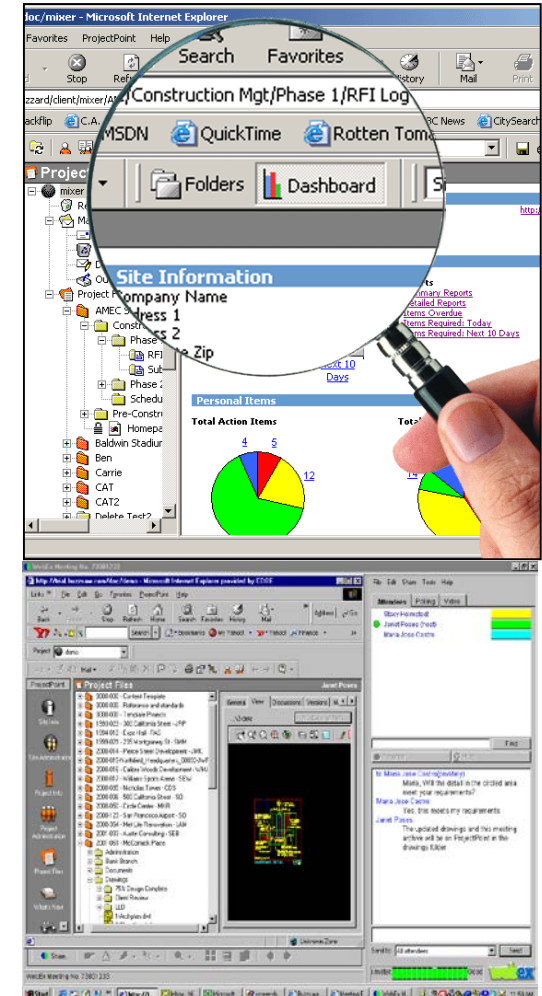


Garland ISD Special
Events Center, HKS, Inc.

Saving Time: Wyndam Hotels

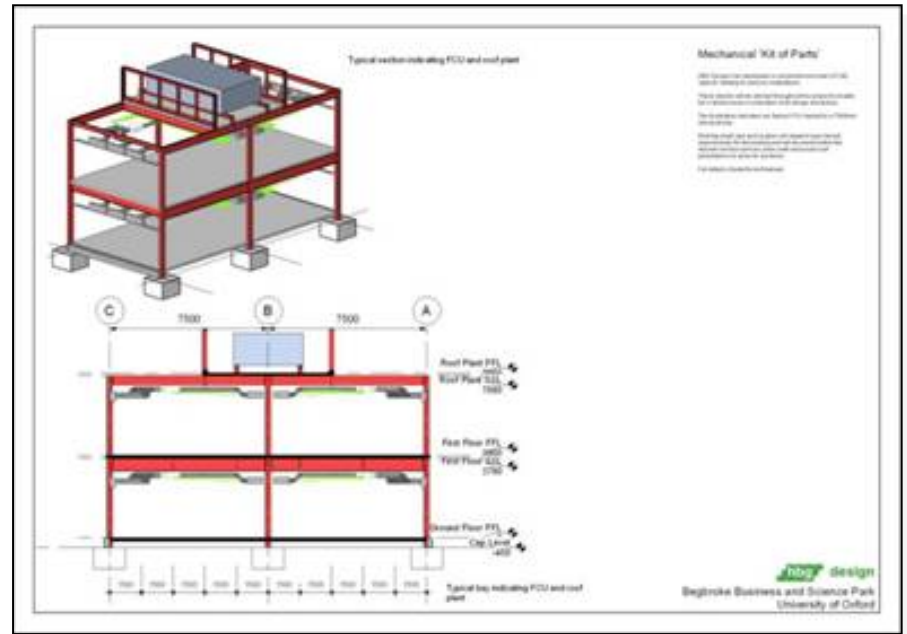
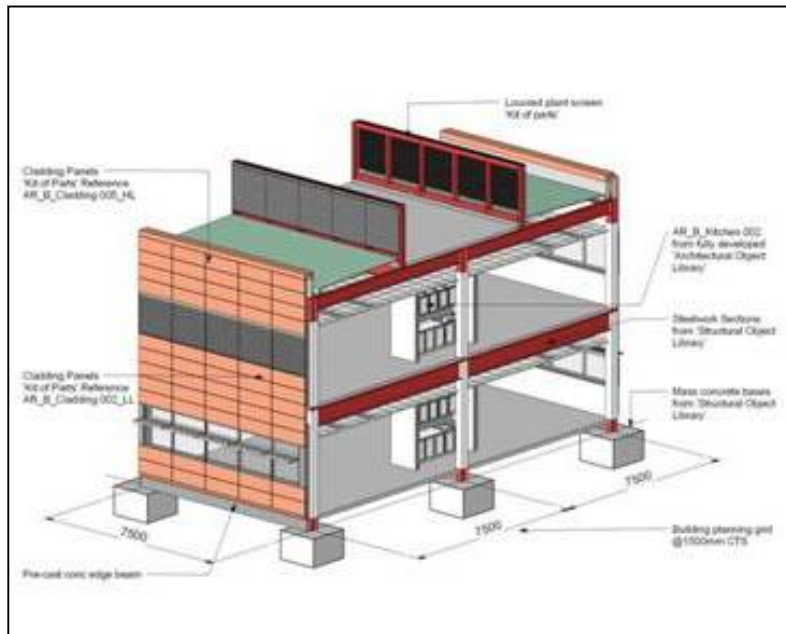


Wyndham Buena Vista Palace



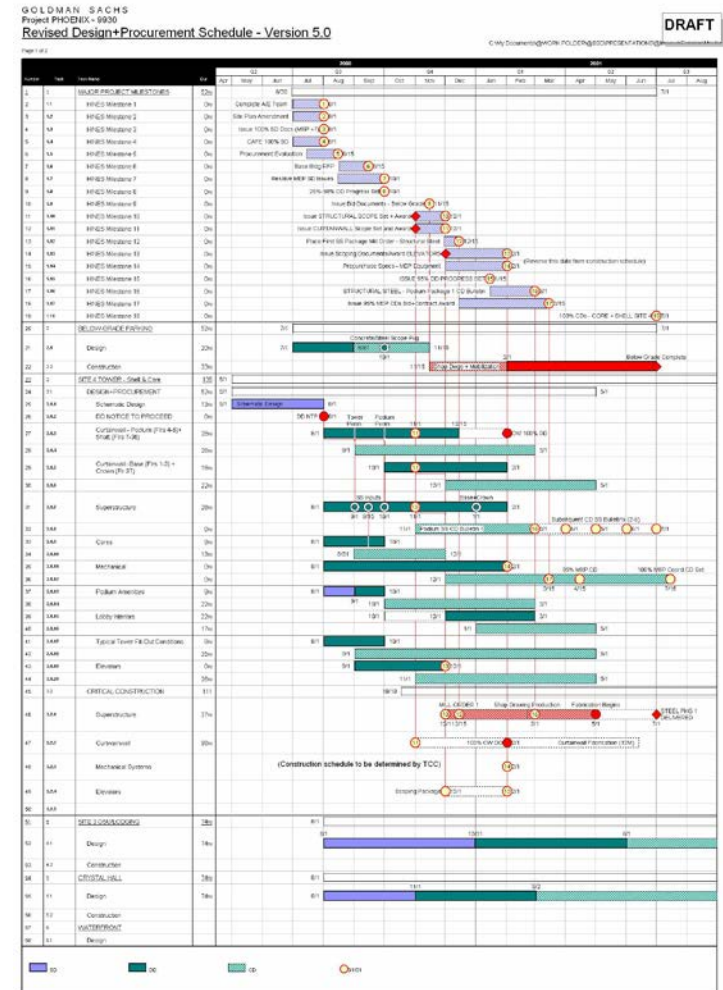
Trend: Project Delivery

- Digital information is blurring traditional relationships between design, procurement, and construction, creating new opportunities for changing methods and roles in project delivery



The Value of BIM/BLM in Project Delivery

- BIM/BLM enables high-speed collaboration and digitally supported **design, analysis, procurement, fabrication and assembly**, creating new delivery paradigms
 - Design-build
 - Hyper-track
 - Bridging
 - Integrated Delivery



Delivery: Flack + Kurtz

*"My main focus on a project is good engineering, leading edge design, and **giving the owner a quality project** that will be recognized within our industry and hopefully throughout the world. **ABS** is key to ensuring that our design is fully coordinated with architecture before we get into the construction administration phase."*

Wayne Gaw, Flack + Kurtz



Trend: New Sources of Income

- Tighter delivery
- Reduced risk
- Digital assets
- Supporting the lifecycle
- New Business Models



Value of BIM/BLM = New Fee Opportunities

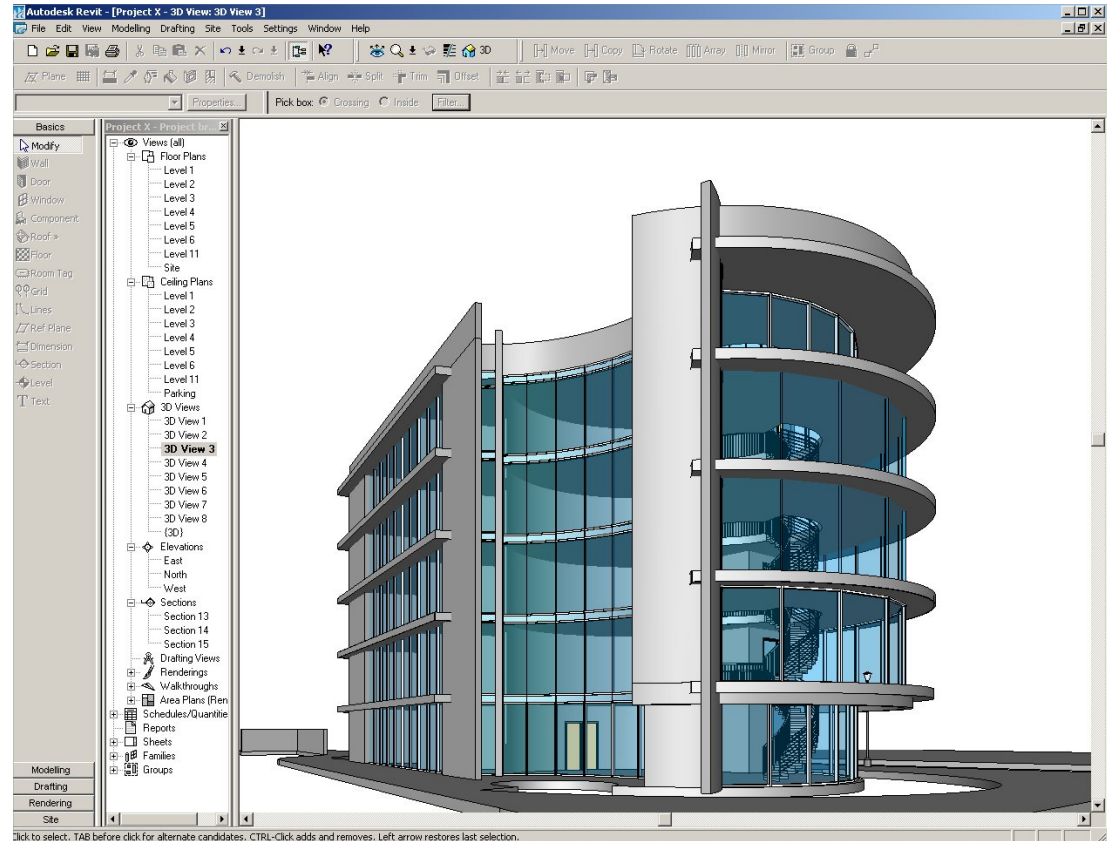
FEE STRUCTURE AND TEAM IMPACTS							
Phasing	Fee Distribut	Schedule			Design Team		
	Percent	Phase Starts	Phase Ends	Total Weeks	Total Hours	Hrs/ Wk	Team FTEs
0 (Hold for Project Management / MP)		11/01/2003	04/01/2006	126.0		50	
A Schematic Design	38%	11/01/2003	01/31/2004	13.0	5,176	50	8.0
B Design Development	44%	02/01/2004	05/31/2004	17.1	5,622	50	6.6
C Construction Documents	8%	06/01/2004	02/01/2005	35.0	1,014	50	0.6
D Procurement	0%	02/02/2005	04/01/2005	8.3	54	40	0.2
E Construction Administration	9%	06/30/2004	04/01/2006	91.4	1,165	40	0.3
TOTALS	100%			126.0	13,030		

- Digital information is **valuable**:
 - Owners are demanding digital models and **paying for them**
 - Supports creation of **digital assets** that are valuable to owners
 - **Services can expand**

Profit: WATG

"When you design a building using Revit, you create an intelligent data model of the building that can be used more effectively than standard two-dimensional documents. It gives building owners infinite possibilities in terms of utilizing that data downstream in operations management, maintenance, and improvements."

Larry Rocha,
Wimberly Allison Tong and
Goo



What your Colleagues are Doing

- Implementing Revit to win business as design and presentation tool
 - Studio Kremer, HH, Burt Hill
- Fully implementing Revit today
 - Atunovich, Oculus, JBHM, Parkhill Smith Cooper
- Using AutoCAD today with Revit pilots
 - EB, EYP, HKS, Little, WATG
- Implementing ADT and ABS today
 - F&K, Corgan Architects
- Implementing ADT today with Revit pilots
 - GHC, Gensler, HOK, DMJM, SOM



Revit



Architectural Desktop Building Systems



AutoCAD

Implementing Revit

"They were amazed that we were able to show them in the interview what their building could look like. It went a long way in helping us secure that contract."

Scott Kremer,
President,
Studio Kremer
Architects



Implementing Revit Today

"We embrace change and are willing to adjust our process to benefit from the best technology we can find."

Ron Reim, Founder and Principal, Oculus, Inc.



Implementing Revit Today

"Success is measured in customer satisfaction. The most important thing from my perspective is to have a happy client. And Autodesk Revit has helped that to happen."

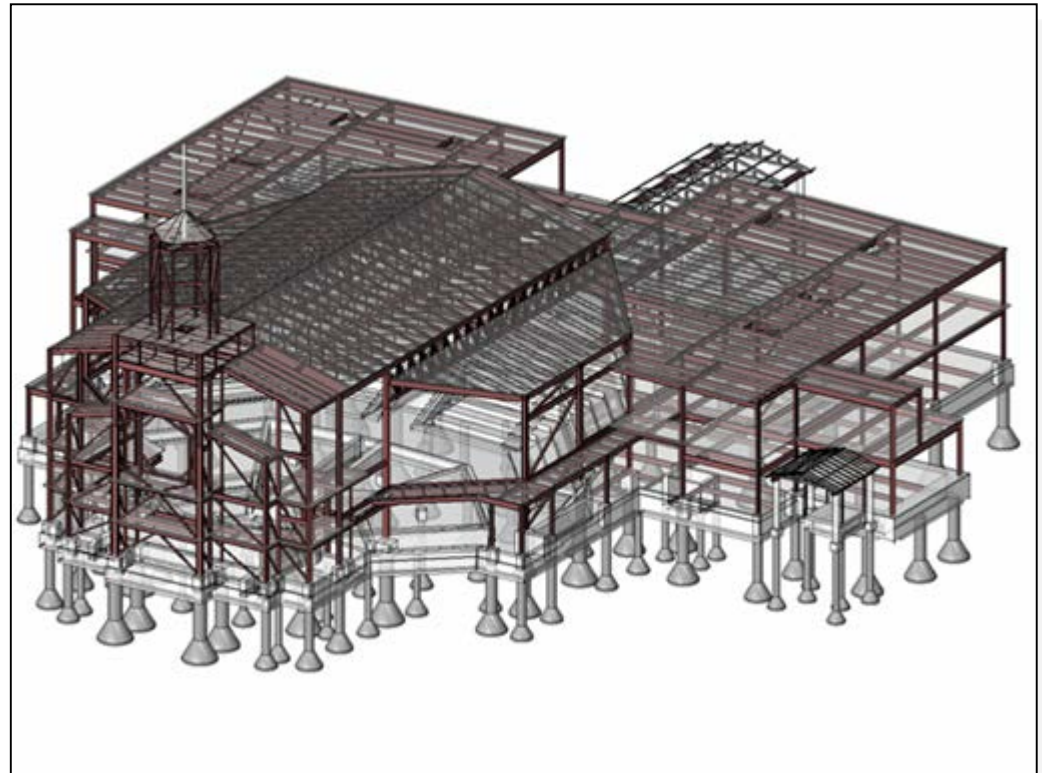
Scott Ferguson,
Project Architect and Principal,
Antunovich Associates



Using AutoCAD with Revit Pilots

"It's crucially important to be able to synchronize 3D with construction documents. A client buys a project based on images; when or if the final building doesn't match that conception, then you've got a problem," says Chauvier. "...having the ability to match conceptual design with construction documents and not have that compromised through changes is a strong plus."

E. Davis Chauvier, CIO, HKS



HKS, Inc.

Implementing Architectural Desktop 2004 Today

"We implemented the software and designed the Cape Girardeau Federal Courthouse in the same time it would have taken us to just design it in AutoCAD. The cost of the software plus training has paid for itself in this project. Fentress Bradburn will be designing many more projects in Autodesk Architectural Desktop 2004."

Tracy Matteson, CAD Manager,
Fentress Bradburn



Implementing ADT 2004 with Revit Pilots

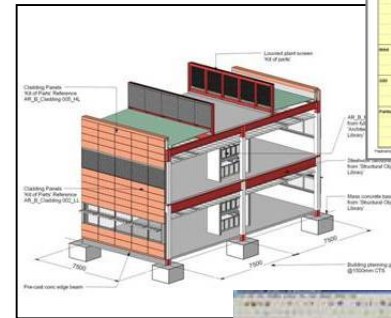
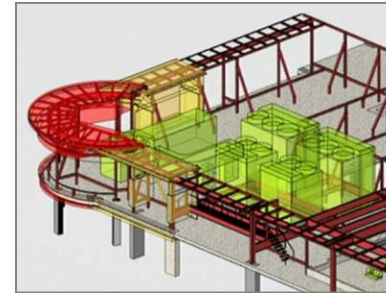
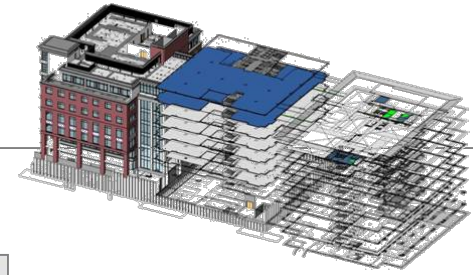
"They awarded it [project] to us because they see the value in what we bring to them as a cutting edge design team. Revit is an important element in the whole concept of how we deliver a product."

Rob Smedley, AIA, Project Design Manager, DMJM



Key Themes

- **Coordination:**
 - Eliminate errors & omissions
- **Time:**
 - Increase efficiency
- **Delivery:**
 - Enable new ways of working
- **Profit:**
 - Create new fee opportunities



How Autodesk Can Help

- Autodesk & ASC Partner Sales Teams
- Autodesk Professional Services
 - Process review
 - Implementation and training services
- Subscription
 - Protects your technology investment





Survey Says... 2004

- What is the future of ADT? Revit?
 - *Future of ABS? Plans for building systems application on Revit?*
- Plans to ease transition from ADT to Revit without data loss?
- Strategy for combining all building industry applications into one, comprehensive solution?
- Due date for Revit 6? What are the key new capabilities?
- When will API be available for Revit?
- What's Autodesk's view on the role and importance of software standards and interoperability?
- What is the future of VIZ?

“...(A)n important dynamic of the new economy—the *real* new economy—is the virtuous cycle of competition, innovation, and productivity growth.”

Diana Farrell, McKinsey Global Institute
“The New Real Economy” HBR 10/03



See what's
out
there.



Thank you!



autodesk

Right here.