

BIM in Construction & Facilities

Show Me the
Information!

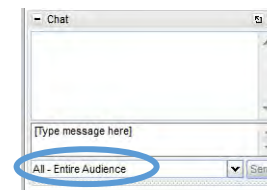
Presenter

Andrew Sova CM-BIM
LEED Green Associate, CSI



Welcome!

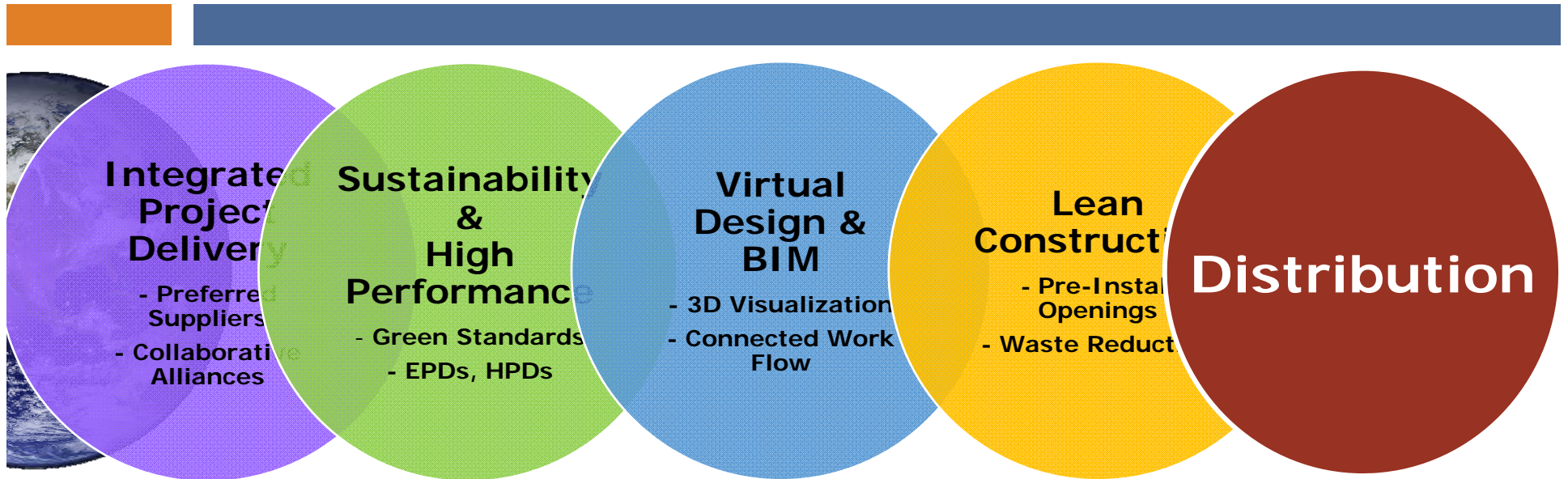
- 3 DHI CEP pts. available for each 1 hr. webinar.
- A recording of today's webinar will be available on DHInteractiv for members
 - Handouts and additional information available
 - Notified via email when recording is available
 - Go to *DHInteractive*
 - Click on *Membership* on top left
 - Click on *Members Only*
- 1 hr. presentation, Q & A at the end
 - Submit questions via Chat/Question box
- All attendees muted



The *BIM Process* – NOT for ME!

- Too much upfront work.
 - *Too much transparency - "Margin in Mystery"*
- I don't see BIM in my market.
 - BIM will be the death of distribution.
 - Liability and risk are increased.
 - High cost of technology requirements.
 - Don't have necessary skill sets or knowledge.
- *Not required in my scope of work.*
 - Doesn't apply to doors and hardware.
 - Why should I do Contractor's work?

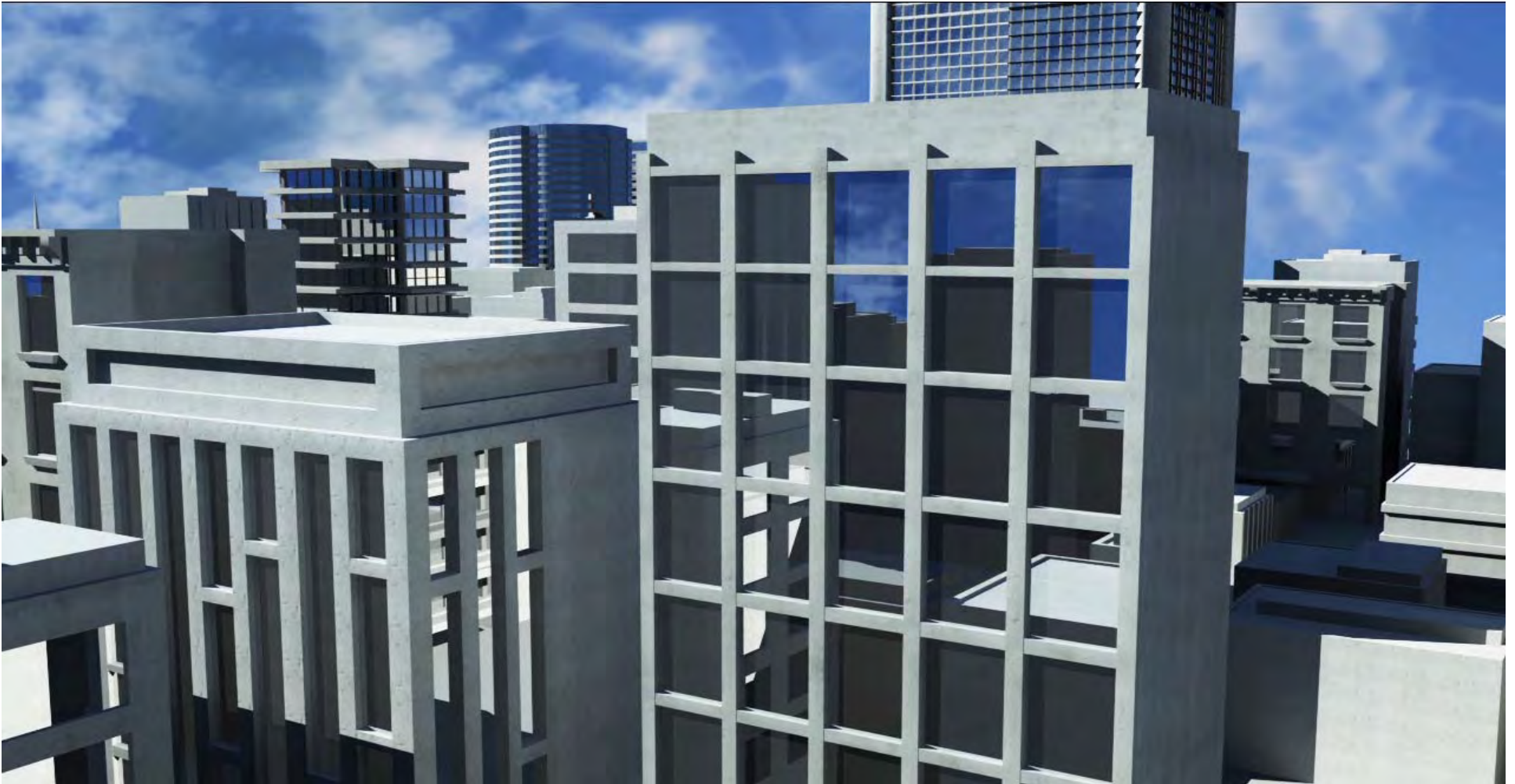
A *NEW* World ..

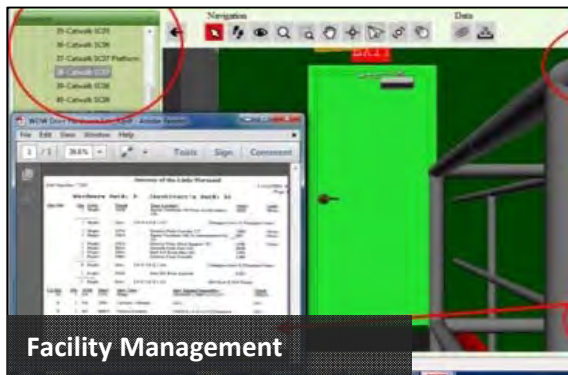
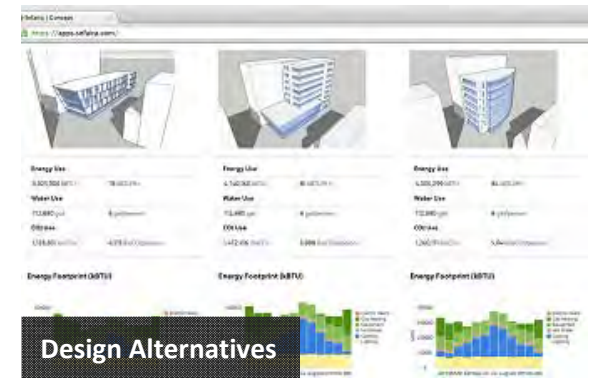
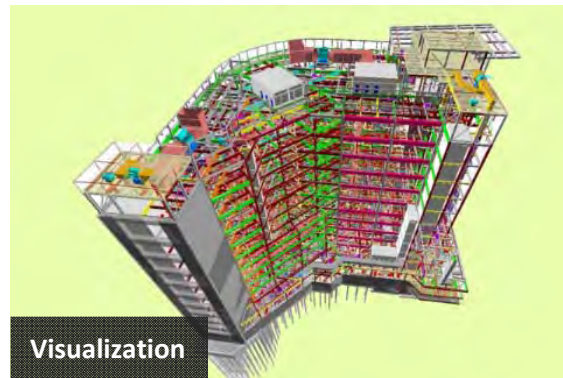
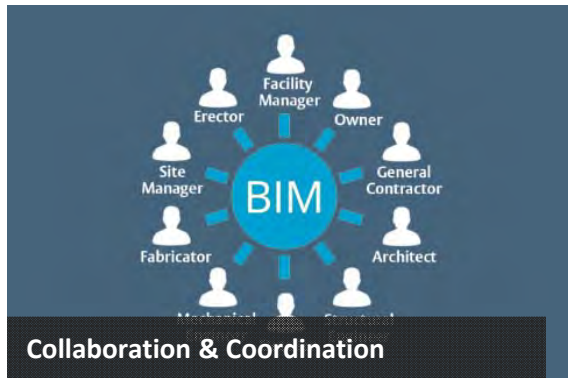


Doing New Things in Old Ways ..

Doing New Things in New Ways ..

BIM– What does it "really" mean?





BIM

BENEFITS



Construction Project Management Functionality

Change Orders	RFIs & Submittals	Project Scheduling
Document Control	Equipment & Resources	Bid Proposals
Transmittals	Purchase Orders	Job Costing & Budgeting
Project Management		
Bid Management	Accounting / Job Costing	Field Service Management





FAMILY FEUD FAMILY FEUD FAMILY FEUD FAMILY FEUD FAMILY FEUD

Distributor

FAMILY FEUD FAMILY FEUD FAMILY FEUD FAMILY FEUD FAMILY FEUD

Round 1

XXX

Distributor

FEUD

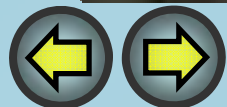
Change Mgmt. 30

Service 5

Material Tracking 26

Installation 20

Quality Control 19



Begin



Win



Lose



Cheer



Boo



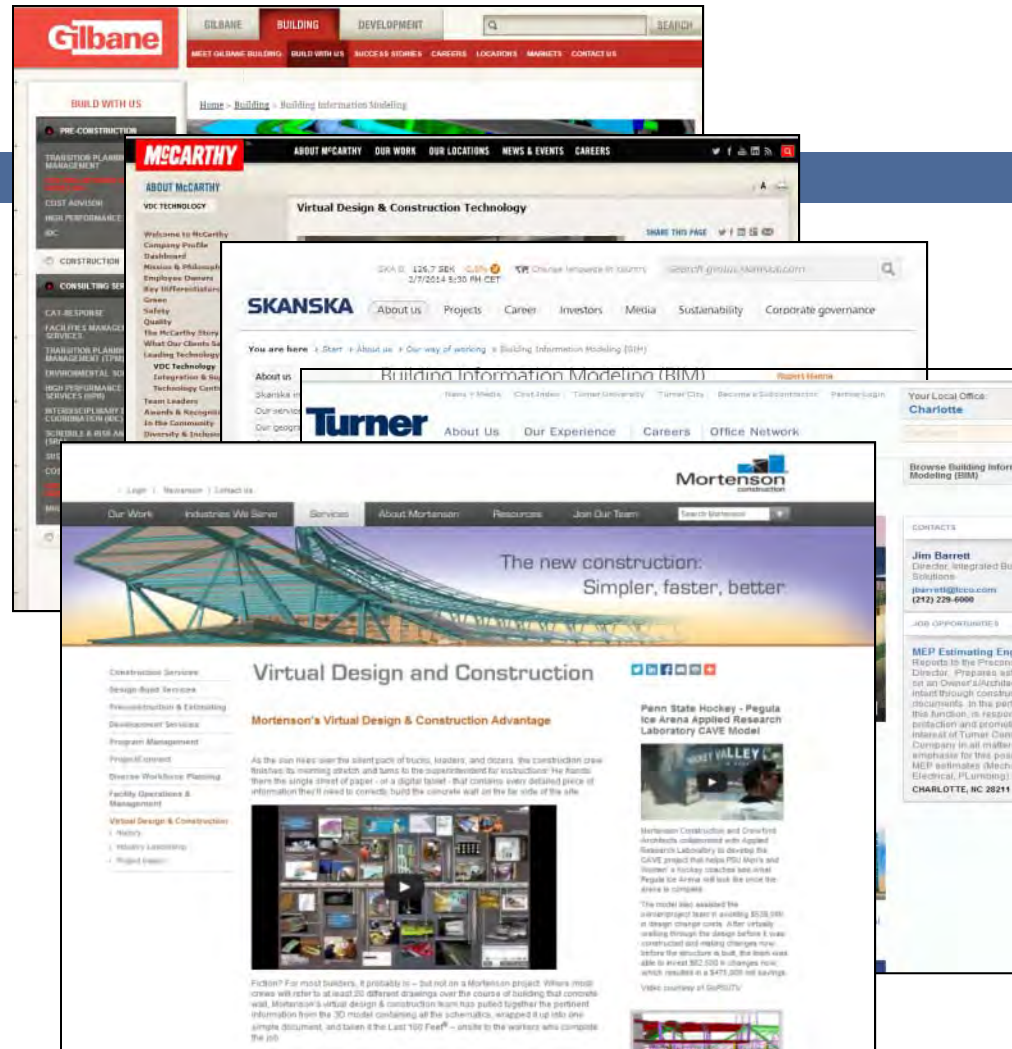
Silence



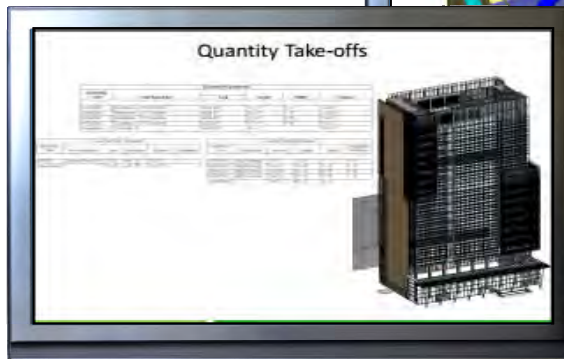
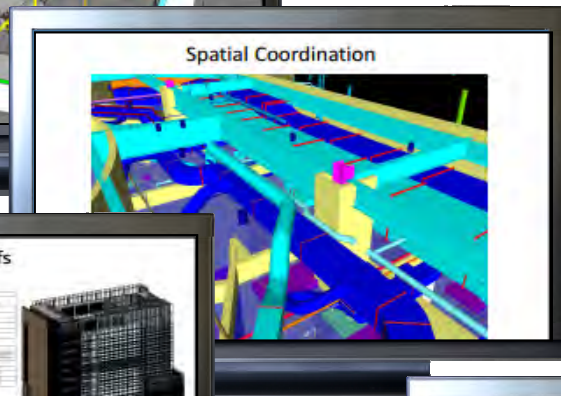
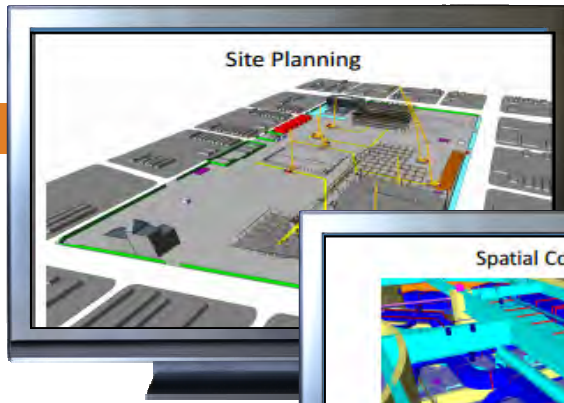
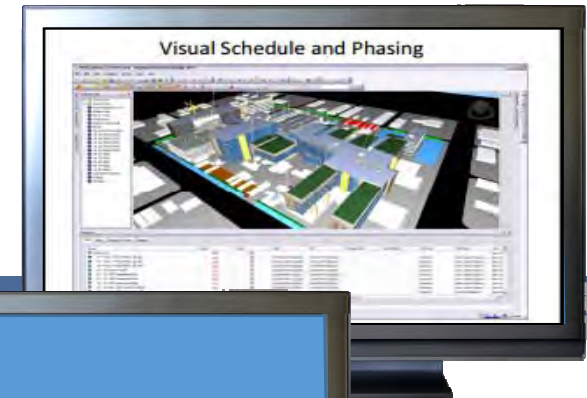
Construction

1. Turner Corporation
2. Skanska Corporation
3. Hensel Phelps Construction
4. Mortenson
5. Balfour Beatty-US
6. McCarthy Holdings
7. Holder Construction
8. Whiting-Turner
9. Lend Lease
10. Hoffman Corporation
11. Walsh Group
12. PCL Const Enterprises
13. JE Dunn Construction
14. Clayco
15. DPR Construction
16. Swinerton
17. Gilbane Building Co.
18. Suffolk Construction
19. Structure Tone
20. Pepper Construction Group
21. Weitz Co.
22. Manhattan Construction
23. Austin Industries
24. Power Construction
25. Brasfield & Gorrie

Top 25 *BIM* Firms



B Information M - "Applications"



Facility Management

- **83%** of the life cycle for a typical building occurs after construction.
- Utilize models and data for maintenance and future expansion.

CURTAIN WALLS

Requirements	LOD 100	LOD 200	LOD 300	LOD 400
Type/Dimensions	*	*	*	*
Base Constraint	*	*	*	*
Base Offset	*	*	*	*
Top Constraint	*	*	*	*
Top Offset	*	*	*	*
Height		*	*	*
Room Bounding		*	*	*
Structural			*	*
Structural Usage			*	*
Material			*	*
Mark			*	*
Phase Created				*
Phase Demolished				*

DATA DEVICES

Requirements	LOD 100	LOD 200	LOD 300	LOD 400
Type/Dimensions	N/A	*	*	*
Level	N/A	*	*	*
Elevation	N/A	*	*	*
Panel	N/A		*	*
Circuit Number	N/A		*	*
Electrical Data	N/A		*	*
Material	N/A		*	*
Mark	N/A		*	*
Phase Created	N/A			*
Phase Demolished	N/A			*

DOORS

Requirements	LOD 100	LOD 200	LOD 300	LOD 400
Type/Dimensions	N/A	*	*	*
Level	N/A	*	*	*
Sill Height	N/A	*	*	*
Material	N/A		*	*
Mark	N/A		*	*
Phase Created	N/A			*
Phase Demolished	N/A			*

Part Four Glossary and Appendix / Object Requirements

39

FBA – Flush Bolt (Automatic)
PA – Power Assist
KP – Kick Plate

LS – Lockset (Storage)
PP – Push Plate
PU – Pull

SS – Smoke Seal
TH – Threshold
WS – Weatherstripping

[Return to Table of Contents](#)

* See next page for additional Revit Architecture Door Types.

[Abbreviations](#)

B Information M - "Applications"

	A	B	C	D	
	COBie				
1	Name	CreatedBy	CreatedOn	Category	
3327	Threshold	rich.mitre	2012-12-1	Requirement	Cor
3328	DoorFrame	rich.mitre	2012-12-1	Requirement	Cor
3329	HardwareSet	rich.mitre	2012-12-1	Requirement	Cor
3330	WeatherStrpping	rich.mitre	2012-12-1	Requirement	Cor
3331	JambNumber	rich.mitre	2012-12-1	Requirement	Component
3332	SoundProof	rich.mitre	2012-12-1	Requirement	Component
3333	DoorThickness	rich.mitre	2012-12-1	Requirement	Component
3334	DoorWidth	rich.mitre	2012-12-1	Requirement	Component
3335	HeadNumber	rich.mitre	2012-12-1	Requirement	Component

4.4 COBie/Commissioning Deliverables

USF has adopted Construction Operations Building Information Exchange (COBie) as the methodology to electronically transfer building information from the design process and BIMs to other university systems. Autodesk provides a utility (Autodesk - COBie Toolkit for Revit) to facilitate the automatic creation and transfer of data between BIM and the COBie Microsoft Excel spreadsheet format. Where possible, automatic means should be used to create and fill in the COBie data.

The Design/ Construction Team shall consult their BIM software vendor(s) for the most current COBie utilities. However, the completed COBie worksheets may also contain some information that is entered manually into the Microsoft Excel electronic file, either because the information currently cannot be conveniently extracted from the BIM or because it does not reside in the BIM.

The Design/ Construction Team is encouraged to provide COBie data as known at the time of each deliverable. The required worksheets in COBie shall be filled out in step with the LOD design and project phases.

Door 2A06	J11, J10	n/a	Autodesk	Autodesk	485513	n/a	n/a
Door 2A06	n/a	n/a	Autodesk	Autodesk	485507	n/a	n/a
Door 2A06	45 mm	n/a	Autodesk	Autodesk	485501	n/a	n/a
Door 2A06	915 mm	n/a	Aut		497	n/a	n/a
Door 2A06	H8	n/a	Aut		515	n/a	n/a



BIM *Contract* and *Code* Language

Please reference Special Condition No. 16 in this Bid Package.

A. Explanation of

BIM PROJECT EXECUTION PLAN

[VERSION X]

[PROJECT TITLE]

[PROJECT NUMBER]

DEVELOPED BY [AUTHOR COMPANY]

[DATE]

Document G202™ – 2013

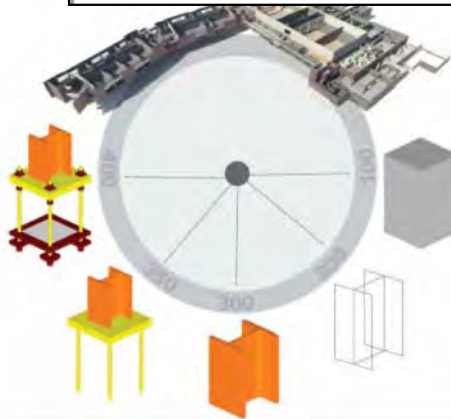
Modeling Protocol Form

protocol is distributed. Include

4.3 Final BIM Deliverables

It is USF's intention to use the BIMs for Facilities Management upon occupancy. Information that matures during the construction process is to be captured in the appropriate BIMs on an on-going basis throughout the construction phase. The use of these BIMs is a developing methodology, and presently, multiple formats of information are required.

Upon Substantial Completion, BIM files shall be submitted to USF FPC, and shall be cleaned of extraneous "scrap" or "working space" layers, stories, abandoned designs, object creation and testing places, empty layers, and other content, which is typically produced in BIM production.



The following document is the OPP BIM Project Execution Plan Version 2.0. This template is a tool that is provided to assist in the development of a BIM Project Execution Plan as required per contract. It was adapted from the [buildingSMART alliance™](http://www.buildingsmart.org), (bSa) project "BIM Project Execution Planning" as developed by The Computer Integrated Construction (CIC) Research Group of The Pennsylvania State University. The bSa project is sponsored by the Charles Pankow Foundation (www.pankowfoundation.org), Construction Industry Institute (CII) (www.construction-institute.org), Penn State Office of Physical Plant (OPP) (www.opp.psu.edu), and The Partnership for Achieving Construction Excellence (PACE) (www.engr.psu.edu/pace). The BIM Project Execution Planning Guide and corresponding templates can be downloaded at www.bim.psu.edu.

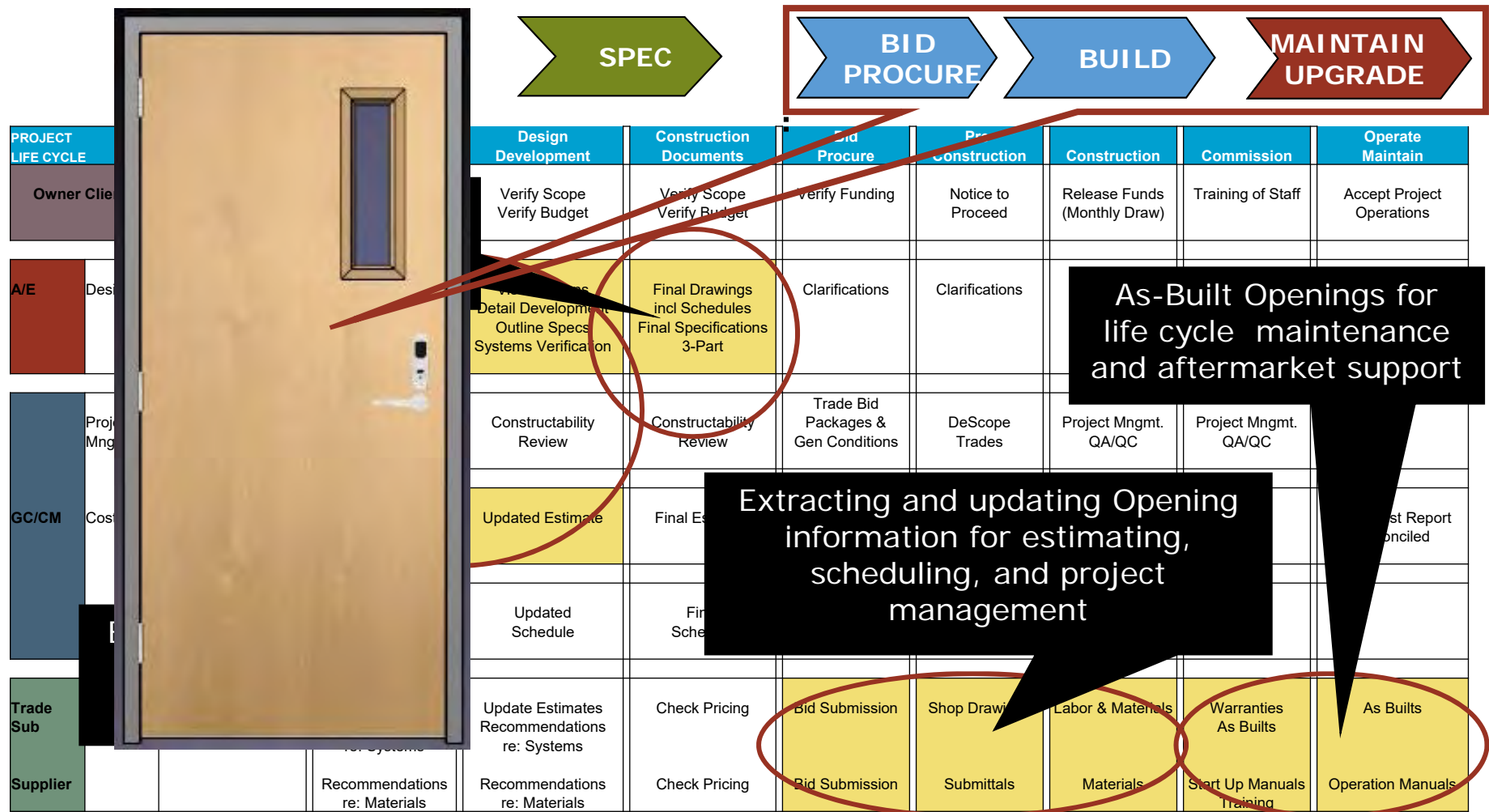
Please direct any questions about this template to Colleen Kasprzak (cmk264@psu.edu).

Please Note: This coversheet can be replaced by a project specific coversheet that includes at a minimum: document title, project title, project location, author company, and project number. Instructions and examples to assist with the completion of this guide are in grey font (R: 127, G: 127, B: 127). The text can and should be modified and/or deleted to suit the needs of the organization completing this template. If modified, the format of the text should be changed to match the rest of the document by selecting the "Text" style in template styles. Font within sections should be Arial, size 9, black. All tables contain a row for additional information. Delete this row as necessary for the project information. Recommendations for sections can be seen as comments by "ck" and will need to be viewed as "Final: Show Markup".

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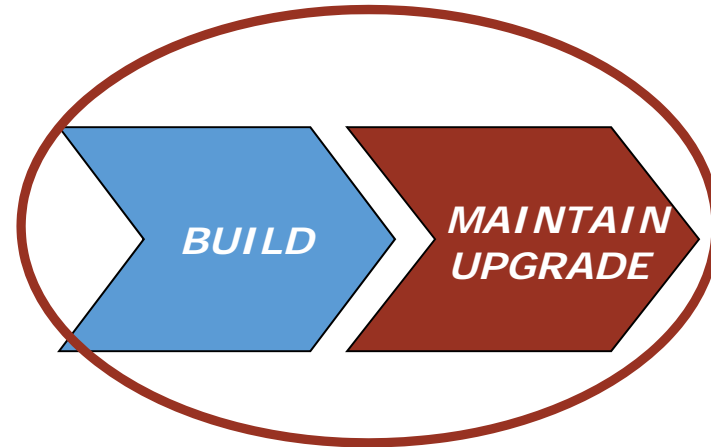
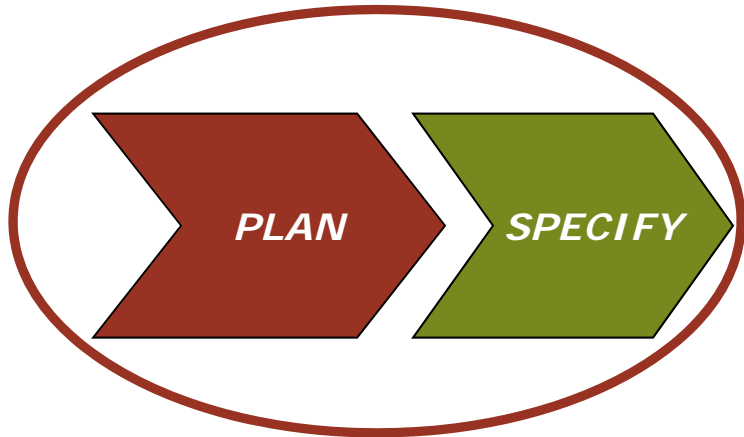
BIM Design, Construction, and Lifecycle

... a collaborative *PROCESS*





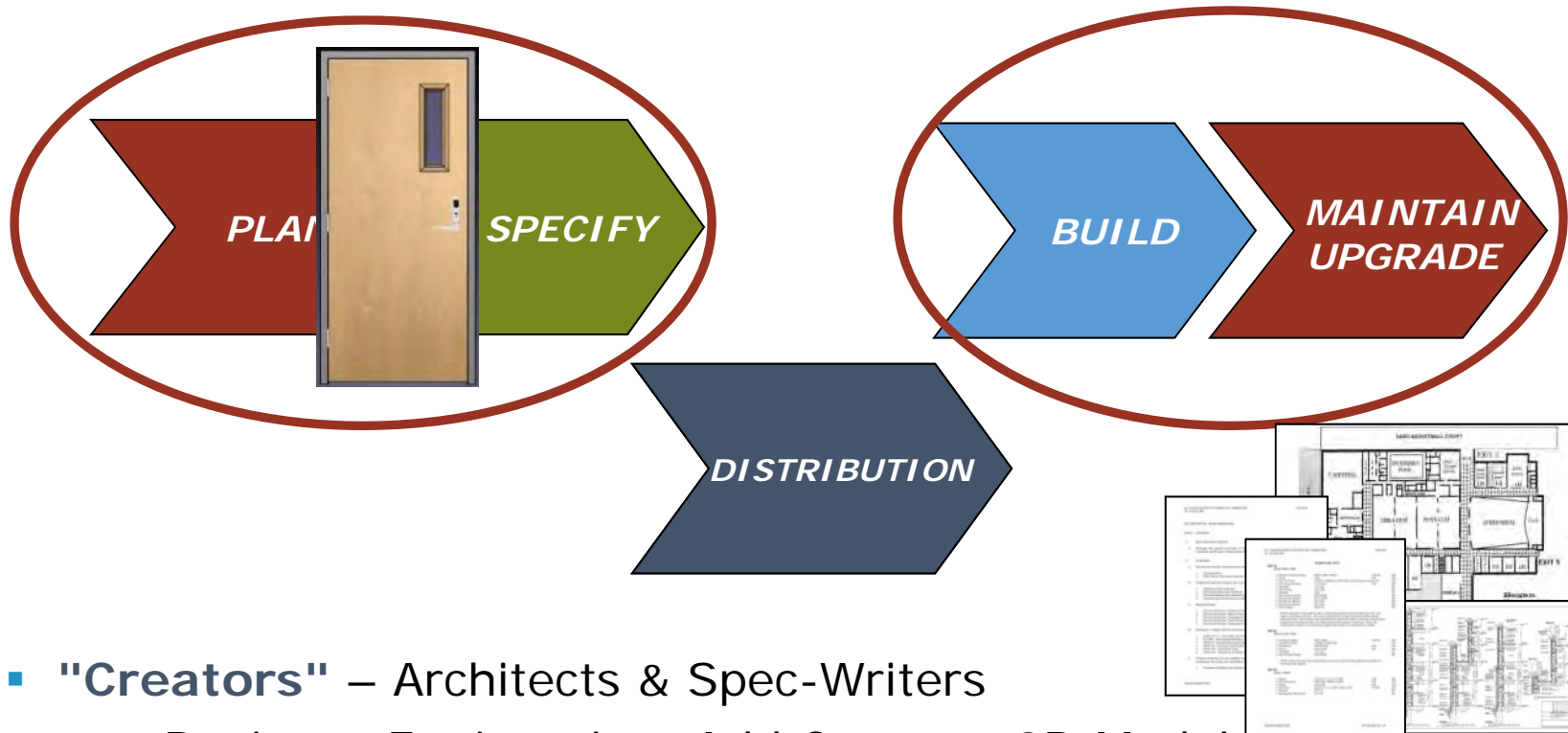
BIM .. is a PROCESS!



- **"Creators"** – Architects & Spec-Writers
 - Design & Engineering, Add Content, 3D Models.
- **"Consumers"** – Contractors, Owners & Facility Managers
 - Leverage BIM to improve construction & facilities management.



BIM .. is a *COLLABORATIVE* process!



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11

24. LOCAL NUMBER CENTER ADDRESS
24. LOCAL NO.

SECTION DETAIL: EXISTING ADDRESS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Conditions and Division 1 Specifications

1.2 SUMMARY

1. Section Includes

A. Existing Address

B. New Address

C. New Address

D. New Address

E. New Address

F. New Address

G. New Address

H. New Address

I. New Address

J. New Address

K. New Address

L. New Address

M. New Address

N. New Address

O. New Address

P. New Address

2. Related Section: [Blank]

24. LOCAL NUMBER CENTER ADDRESS
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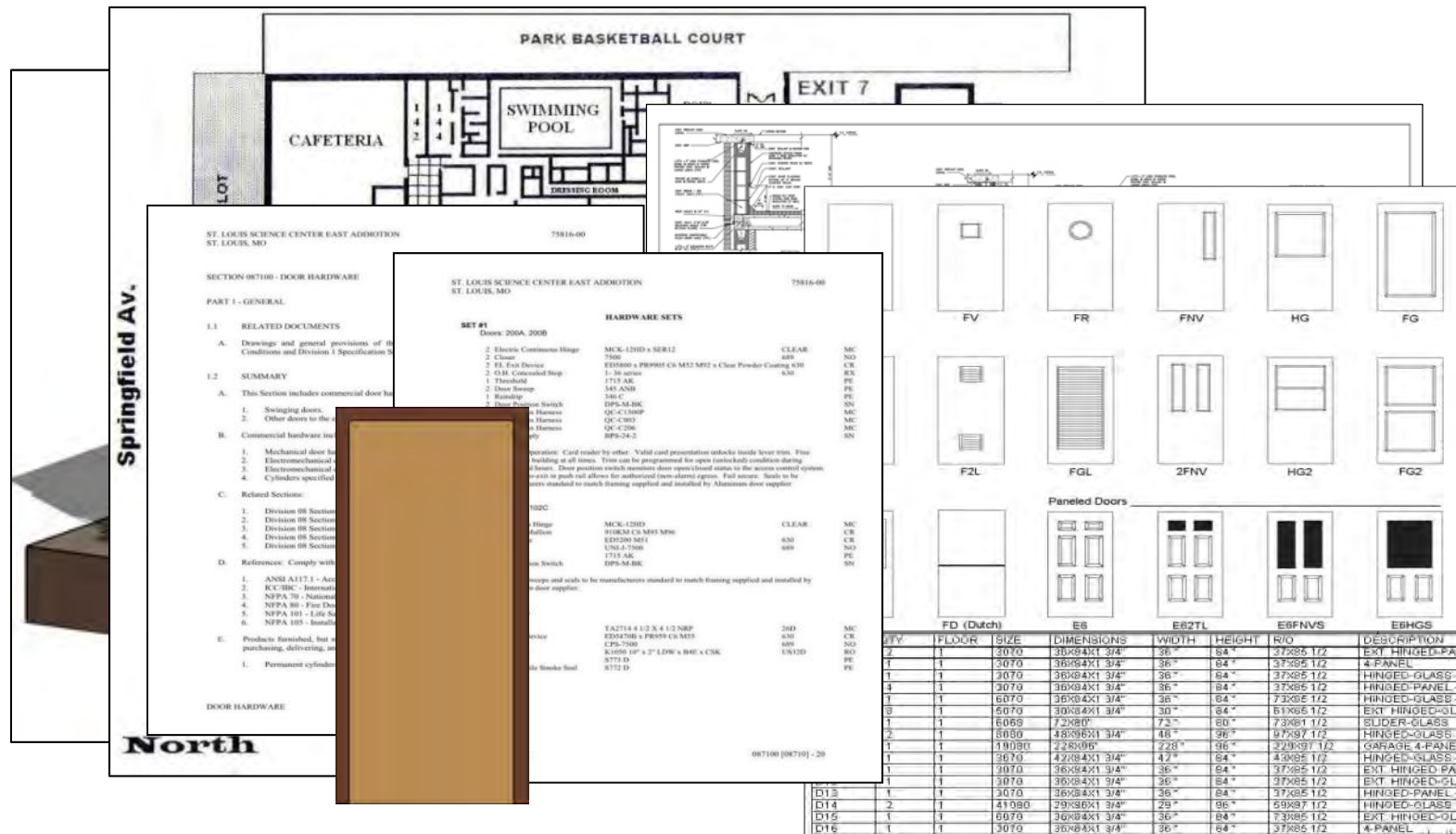
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P. New Address

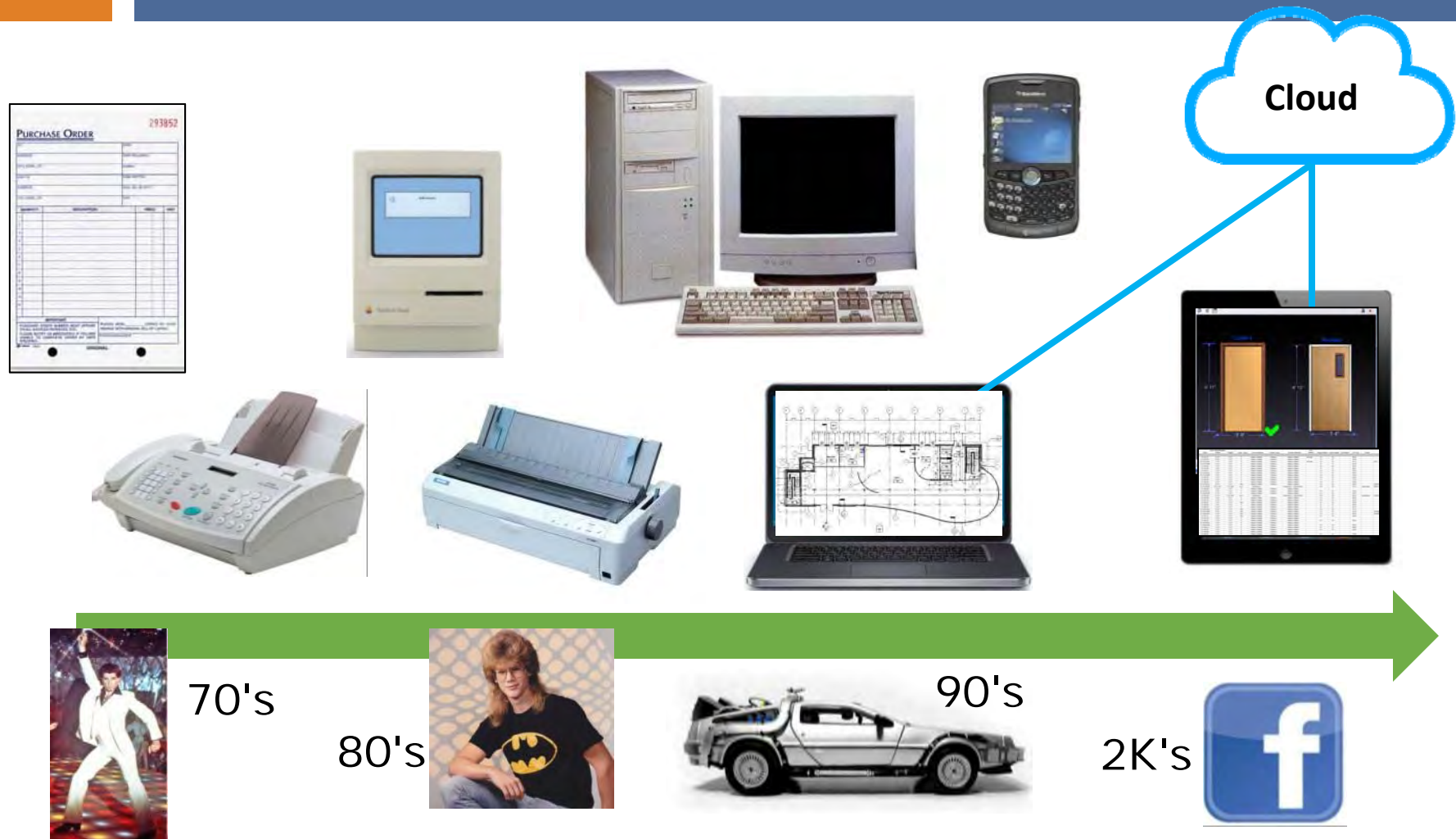
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BIM 3D Process

Improved Accuracy & Productivity



Impact of *Technologies* on *Information*



B I *information* M - "Deliverables"

- A "**deliverable**" is a mechanism used to relay information, instructions, changes, and data from one party to another
... in a **useful** format.
- How can our industry better harness and convey the information created with BIM tools?
- What will be the new "conventional" process?
- What are the expectations?



3D Door Families

Door Schedule Door Parameters

Door Identification			Door Type	Door Material	Frame Type	Frame Material	Fire Rating	Head Detail	Jamb Detail	Sill Detail	HW Set	Finish	
Mark	Width	Height											
01.03.01	6'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal	45 min	14	14		46.0		
01.03.02	6'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		79.0		
01.03.03A	7'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal	45 min	14	14		81.0		STC
01.03.03B	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		84.0		
01.03.04	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		82.0		
01.03.05	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		86.1		
01.04.01	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		59.0		
01.04.02A	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		44.0		
01.04.02B	7'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		50.0		
01.04.03	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		58.0		
01.04.05	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		73.0		
01.05.04	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		58.0		
01.05.05A	6'-0"	7'-2"	N8	Hollow Metal	3 Piece	Hollow Metal		14	14		20.0		CR,EX
01.05.05B	6'-0 1/2"	7'-4 3/8"	AL1	Aluminum		Aluminum - Storefront		16	16		01.0	anodized	DPS, E
01.05.06	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal							
01.05.07A	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		44.0		
01.05.07B	7'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		50.0		
01.05.08	5'-11"	7'-9 3/8"	AL1	Aluminum		Aluminum - Storefront		16	16		02.0	anodized	CR,EX
01.05.09	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		59.0		
01.05.10	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		83.0		
01.06.01	3'-0"	7'-2"	N8	Hollow Metal	3 Piece	Hollow Metal		14	14		59.0		
01.06.02	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		86.0		
01.06.03	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		87.0		
01.06.04A	6'-0"	7'-2"	N8	Hollow Metal	3 Piece	Hollow Metal		14	14		37.0		
01.06.04B	6'-0"	7'-2"	N8	Hollow Metal	3 Piece	Hollow Metal		14	14		35.0		CR,RE
01.06.04C	7'-0"	7'-2"	N8	Hollow Metal	3 Piece	Hollow Metal		14	14		36.0		CR,RE
01.07.01	3'-0"	7'-2"	N8	Hollow Metal	3 Piece	Hollow Metal		14	14		59.0		
01.07.04	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal							
01.08.01	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		58.0		
01.08.02A	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal							
01.08.02B	7'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		50.0		
01.08.04	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		86.0		
01.08.05	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		14	14		58.0		
01.08.06	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal							
01.08.07	3'-0"	7'-2"	F	Hollow Metal	3 Piece	Hollow Metal		9	9		75.0		

Openings in 3D

Contractors

TOP Challenges

- Change Management.
- Tracking Material.
- Installation.
- Quality Control.
- Access to Information.

BIM Delivers ...

- **Tracking and Reporting**
for RFIs, delivery, install, &
punch-out.
- Seamless access to
Project Documentation.
- "See before you build".
QC & Waste Reduction.
- Improved installation.
**Pre-Hardware &
Modularization.**
- **eMobility.**

Facility Management

TOP Challenges

- Managing Openings.
- Paper Documents & Changing Information.
- Communicating Design Standards.
- Inspections & Maintenance.

BIM Delivers ...

- **Digital Access** to product data now .. and over time.
- **Interactive Visualization** of installed openings.
- **Virtual Spec Guides** with BIM models.
- **Tracking and Reporting** for Life Cycle Maintenance & Inspections.

Doing New Things in New Ways ..

Distribution

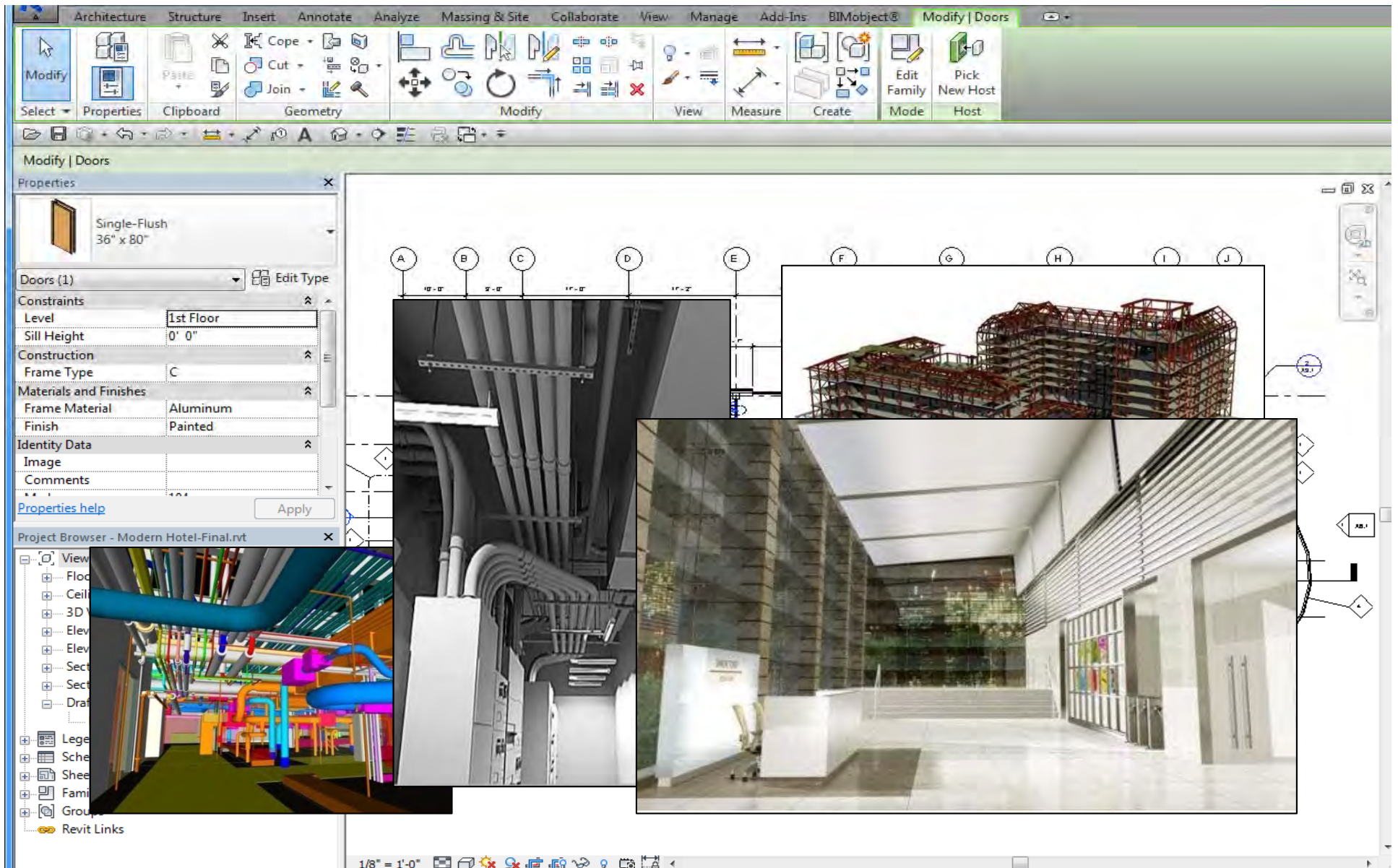
Architect
Design
Model

Simulation
&
Analysis

MEP
Coordination
Model

Costing
Models
Construction
Details







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