Who Needs a Building Information Manager?

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CM7089 Who Needs a Building Information Modeling Manager?

This Building Information Modeling (BIM) management class is designed for CAD and BIM professionals, project managers, and other technical and management professionals who want to obtain the relevant knowledge and skills that are required to set up a company BIM deployment plan and BIM project execution plan and protocol. We will explore everything from making the transition from CAD to BIM, to defining roles and structuring teams. We'll also touch on common issues that arise in BIM projects and we'll show how crucial it is to have someone there to take care of them.

Learning Objectives

At the end of this class, you will be able to:

- Discover the true role of a BIM manager
- Learn how to use knowledge and skills to create a company BIM deployment plan and BIM project execution plan
- Discover issues associated with starting a BIM project
- Discover BIM processes and benefits

About the Speakers

Paul Morrison is an Architectural technician with over nine years of experience in the AEC industry. He currently hold the title at of Technical Director at PROCAD Consultants, an Autodesk VAR and ATC located in Montreal (Quebec). He has been an ACI for almost 4 years now, and recently completed the requirements to be an Autodesk Certified Evaluator. (ACE) He offers consultation, training, technical support, and BIM integration services which include Implementation, project setup, coaching users, BIM managers and business owners, etc. Hands-on experience with both BIM and traditional CAD applications and integration. Very dedicated to the cause of intelligent design. He has personally implemented over 70 offices from CAD to Autodesk Revit in a Bilingual environment.

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Eric is a Senior Architectural Technologist with more than 17 years of experience who began to use Revit since Autodesk acquired it. Eric worked also for an Autodesk reseller as BIM technical director, overseeing the AEC teams and implementing Revit. He was also BIM Leader of a 1.4M sqft hospital project. Eric is currently the President and owner of Zenit Consultants, and holds the position of Co-President of the Montreal BIM User Group.

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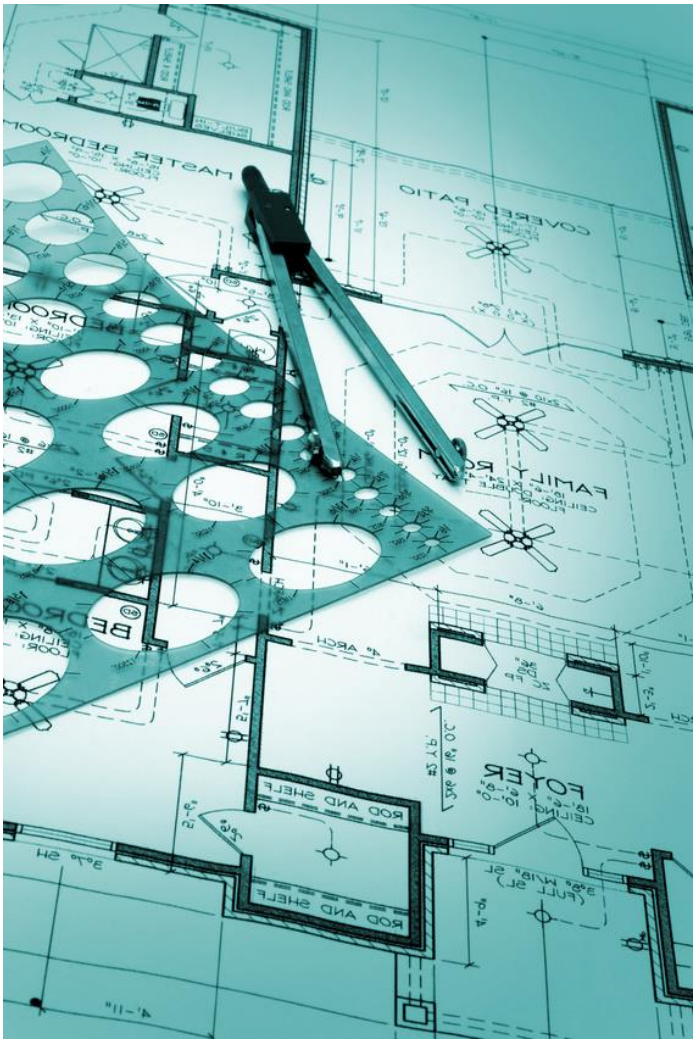
Introduction

BIM Managers are a crucial member of this not so new Process called BIM. This person is generally implicated in all BIM related decisions from Implementation and IT considerations all the way to team structuring and training. To truly understand this species you need to understand its environment. Yes … I said species… we are a rare breed.



CAD did not really change our culture, we just replaced a pencil and velum with a mouse and a monitor. In CAD we draw lines and overlay drawings made from those lines to illustrate design intent in the form of printed and electronic 2D construction documents. In parallel with that we produce many supporting documents such as BOMS, schedules, and 3D models. In the CAD workflow, all these documents are created by different people and products. This has a Great Impact on coordination and compatibility downstream.

With This new Design process, Many AEC Firms are realizing that the key to success in Implementing BIM is to have a BIM Manager. Since the introduction of Computer Aided Drafting, CAD managers were added to the team to ensure consistent standards, efficient workflows and to support team members. Unfortunately do to economic or other reasons the FIRM to CAD manager Ratio has been declining. SO bad that some firms no longer have any CAD management what so ever, only one sad technician, locked in the corner that can kind of remember how create a dynamic block, and where to find the CTB's.

Explaining the True Role of a BIM Manager

Common responsibilities overlooked or ignored when Implementing BIM

Management and mastery of BIM tools (ex. Autodesk Revit Architecture)

Having a mastery of one's design tools adds stability to any BIM implementation. Once a BIM manager is chosen, He becomes the in house Subject matter expert. A resource for everything from family creation and modeling strategies to file management and template customization.

Plan and Oversee product version migrations of BIM tools

If you haven't heard already, Autodesk Revit is version specific when it comes to model and family compatibility. This means everyone has to work on the same platform (Ex. Autodesk Revit 2014). Projects can last years. It is inevitable that you will sooner or later have to migrate to the current version to remain competitive and up to date with all the new features and functionalities. This is not a quick change, it requires careful planning, setup, and testing.

Evaluate New BIM Technology and software for future integration considerations

New software and plugins become available every day. Remember express tools and lisps in AutoCAD, The Web if full of tools and plugins designed to streamline BIM workflows. Someone has to stay on top of these tools and trends to remain competitive.

Decisions concerning BIM technologies and IT infrastructure.
Work stations? Laptops? SSD? Cores in a processor? RAM? ROM? System requirements seem to double every version these days. To remain competitive with these tools you need to have compatible hardware. Someone needs to be on top of what these new tools will run on and how long they can continue to do so, and when it is time to upgrade.

Develop, Implement, apply and document a set of BIM standards-

During Implementation, BIM standards (Templates, BIM plans, BIM Protocols) are created. It is important that someone documents all the progress and uses it to develop internal standards of operation guides. Someone should also be an "enforcer" of these standards.

Creation, configuration, and maintenance of company libraries

Families can be difficult to keep in check. First we need to consider keeping libraries for each product versions. Once a family is saved in a newer version it can no longer be used in previous releases. Someone also needs to ensure that all team members share one combined library instead of what is installed on each client machine. This ensures that team members have access to up-to-date company certified components and families. Project Families should be exported and audited for file size, stability and uniformity on a regular basis. Finally, with Autodesk Revit Forums and websites like Autodesk SEEK Families are available for download everywhere. Families need to be carefully inspected, verified, and adjusted to company requirements. A family submission/audit procedure should be documented and enforced.

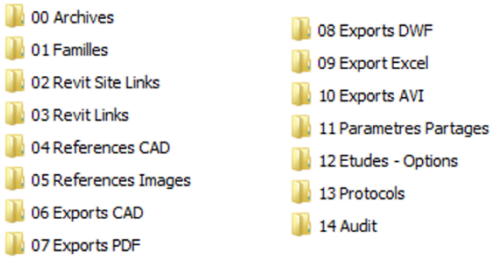
Plotter support

Printing issues usually happen at the worst possible moment. Having an in-house resource with knowledge of possible printing issues can be really helpful. This person can also communicate requirements and problems with vendors. Not all printing issues are printer related. Issues can arise from something as simple as an incorrect graphic card driver (Ex. Text width factors) or unsupported fonts.

Support for electronic file creation such as PDF, DWF, IFC, DWG, DXF, FBX, STL

We have more file formats then ever these days. So many that it takes good folder structure and maintenance to keep these formats in their proper place. Think about PDF support. do you use Cute PDF? Blue beam? Adobe? Pdf creator? What are the limitations? Does it support my sheet sizes? Are you going to send the model to a 3D print service? Are you going to send components of your model to be fabricated? Manufactured? What file format do they need? Can our BIM tool create it? Or do we need another 3rd party. Someone needs to stay ahead of the trends and available formats.

Setting up the project structure.



The organization of all input and output data generated from a BIM model is very important. BIM models allow for export of many more file formats. These should be organized so that they are readily accessible to all. Existing project folder structures can be adapted with minor modifications.

Data exchange formats

how are you going to share all your Building model Information with the other players in your project? RVT? PDF? DWF? CAD? Who is responsible for scheduling and overseeing these exchanges? Data Exchange formats and procedures need to be tested for accuracy and operability. These formats should be agreed on by all parties involved and documented in company protocols.

Create and manage a BIM committee

If there is one thing BIM does, it forces team members to communicate. Creating a BIM committee is a great way to encourage this communication. A BIM committee is group of BIM users in the company who meet on a regular basis to discuss present and future issues on BIM projects. Someone needs to lead and organize these meetings.

Document workflows

Think of how many times do you develop a work around or discover more efficient workflows, and a couple of weeks later someone has the same problem or needs to continue working on a project that uses this walk around. Its reasons like this that require someone to documents these procedures. A BIM manager stays on top of issues like this and documents them in an appropriate place (Protocol, SOP's emails, BIM committee)

Assigning Responsibilities/limits

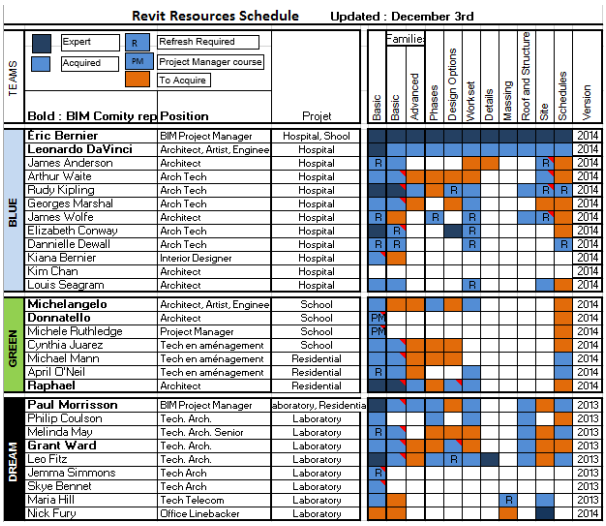
Companies often over model BIM projects. This results in lost time due to redundancies. Project kickoff meetings should include a project modeling responsibility and level of development planning. Documents such as the E-202 document (www.aia.org) help to illustrate who is responsible (MEA) for which elements and to what level of development (LOD).

Evaluate modeling Strategies for Family, project, and conceptual levels

We all think differently. We all use design tools differently. This can lead to inconstancies. Someone needs to isolate the efficient modeling strategies and enforce them. This will increase the quality of BIM content and the uniform creation techniques make changes easier. Strategies used depend on desired deliverables and project requirements (LEED, fabrication, estimation etc.)

Monitor personnel competence

The boss comes in says "I have a great project to use Revit on". He takes whoever is available to make his team. What a recipe for failure. Someone needs to monitor the competency, Skill level and BIM experience of all Team members. By keeping track of this information, Teams can be constructed of members with the proper skill set to complete the project. This information also helps when selecting candidates for future training and update courses.



Revit Resources Schedule Updated : December 3rd

Expert / Acquired / R Refresh Required / PM Project Manager course / To Acquire

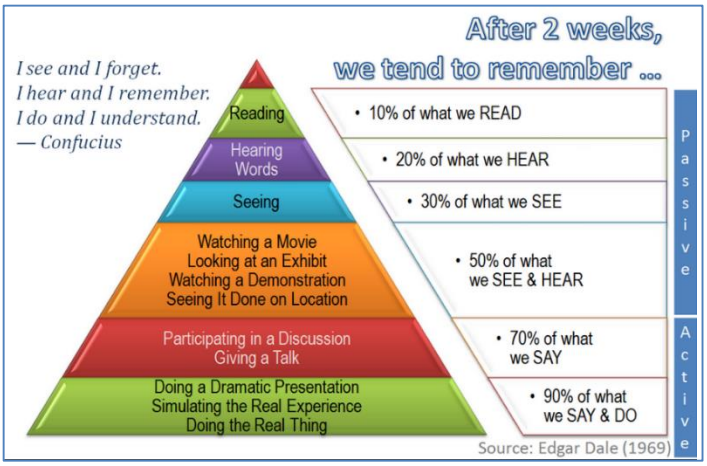
TEAMS	Bold : BIM Comity rep	Position	Projet	Basic	Basic	Advanced	Phases	Design Options	Worksets	Details	Massing	Roof and Structure	Site	Schedules	Version
BLUE	**Eric Bernier**	BIM Project Manager	Hospital, Shool												2014
	Leonardo DaVinci	Architect, Artist, Enginee	Hospital												2014
	James Anderson	Architect	Hospital	R									R		2014
	Arthur Waite	Arch Tech	Hospital												2014
	Rudy Kipling	Arch Tech	Hospital					R					R	R	2014
	Georges Marshal	Arch Tech	Hospital												2014
	James Wolfe	Architect	Hospital	R			R		R				R		2014
	Elizabeth Conway	Arch Tech	Hospital		R				R						2014
	Dannielle Dewall	Arch Tech	Hospital	R	R				R					R	2014
	Kiana Bernier	Interior Designer	Hospital												2014
	Kim Chan	Architect	Hospital												2014
	Louis Seagram	Architect	Hospital						R						2014
GREEN	**Michelangelo**	Architect, Artist, Enginee	School												2014
	Donnatello	Architect	School	PM											2014
	Michele Ruthledge	Project Manager	School	PM											2014
	Cynthia Juarez	Tech en aménagement	School												2014
	Michael Mann	Tech en aménagement	Residential												2014
	April O'Neil	Tech en aménagement	Residential	R											2014
	Raphael	Architect	Residential												2014
DREAM	**Paul Morrisson**	BIM Project Manager	aboratory, Residentia												2013
	Philip Coulson	Tech. Arch.	Laboratory												2013
	Melinda May	Tech. Arch. Senior	Laboratory	R											2013
	Grant Ward	Tech. Arch.	Laboratory												2013
	Leo Fitz	Tech. Arch.	Laboratory					R							2013
	Jemma Simmons	Tech Arch	Laboratory	R											2013
	Skye Bennet	Tech Arch	Laboratory												2013
	Maria Hill	Tech Telecom	Laboratory								R				2013
	Nick Fury	Office Linebacker	Laboratory												2014

Communicate with Autodesk and Resellers

Resellers are on the front line supporting clients, they often have insight into new trends, technologies, and processes that can help your company remain competitive. Communication with Resellers should be more often than a yearly subscription renewal. They have access to top tier support and a wealth of information.

Internal and continuing training

Let's face it training is expensive. Internal trainings can reduce costs and build stronger bonds between employees. There are also many government grants and bursaries that make this process more appealing to owners and associates. We also learn exponentially from teaching. It's



a rewarding process for everyone involved.

Orientation for new employees

New employees are starting to have some BIM/REVIT experience. People tend to get a accustomed to one way of working, and can also develop bad habits. It is important to have someone with the capacity to evaluate and elevate a newcomers skills to an acceptable level. This person also becomes an onsite support resource for the new members.

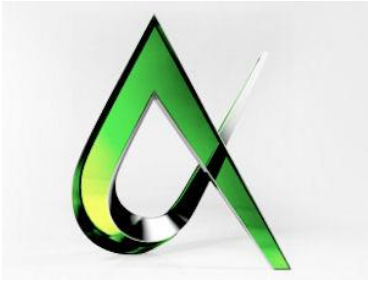
Research and development

There is always room for improvement. With such a vast amount of information and technologies available someone has to stay on top and push the envelope on what BIM can do within an organization. Discussion groups, Forums, Manuals, Conferences and Workshops are some resources available.

Coordination and clash detection

When working with multiple models and disciplines in a BIM project errors can happen. Regular clash detection and coordination meetings are important to keep projects on schedule. Someone needs to be aware of these model issues and be able to delegate responsibility for corrections and changes. A company Protocol and Level of development document can help determine responsibilities

Networking and participation in user groups



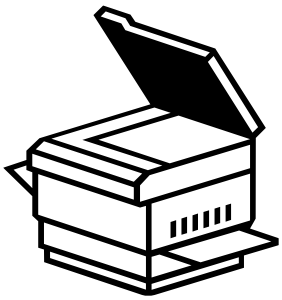
There is only so much you can learn from a user manual. Networking and social interaction with other BIM users is an amazing resource. Online forums like AUGI allow users from around the world to share and contribute information to better the usage of the current BIM and CAD solutions available. This allows users who would otherwise never meet the opportunity to share insight and experience with others on similar positions. Events like Autodesk University provide an enormous amount of information and expertise under one roof. Not to mention the chance to meet people just like you with the same concerns and issues or maybe experience dealing with those issues.

These are just a few of the hats a BIM manager wears on a regular basis. The role of a BIM manager is not one to be taken lightly. It requires an above average set of interpersonal communication skills, a strong knowledge in their required discipline and an extensive knowledge of BIM tools.

BIM Process and Benefits

"The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency."

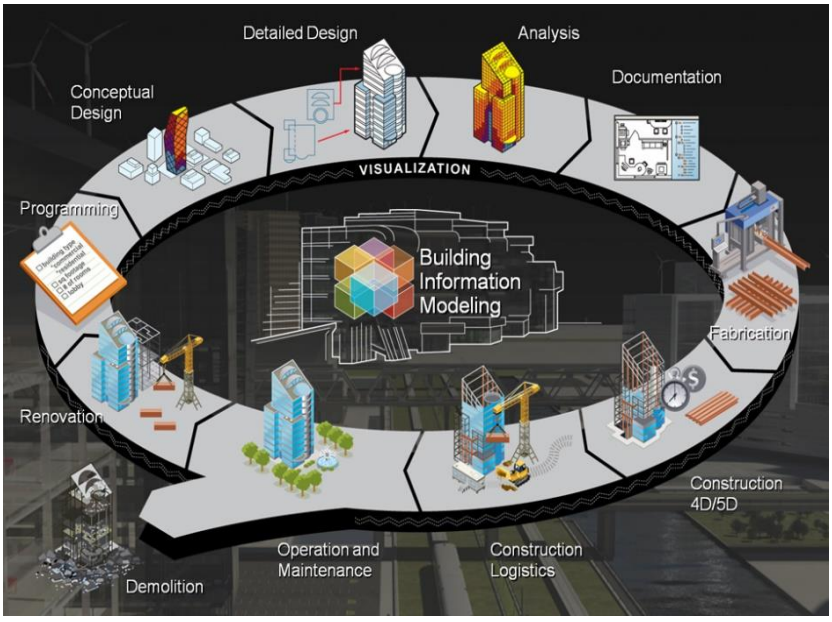
...Bill Gates



BIM is a process, we cannot deny that. It's even an automation by itself; think of how we had to do everything by hand before. For those old enough to remember, we had to photocopy title blocks on reversed stickers to stick underneath our velum pages so we didn't have to redraw the. This was not 30 years back. This was schoolwork back in 1997.

Automation = Revit Operation = BIM

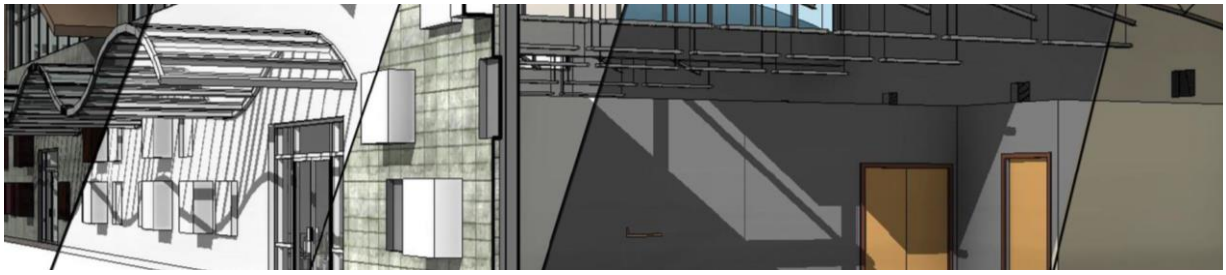
So according to our friend Bill, using Revit on a BIM project in an inefficient manner with insufficient support mechanisms in place, is a recipe for disaster.



We all have seen this kind of image where we can understand that BIM is a Lifecycle and here is how it is supposed to work:

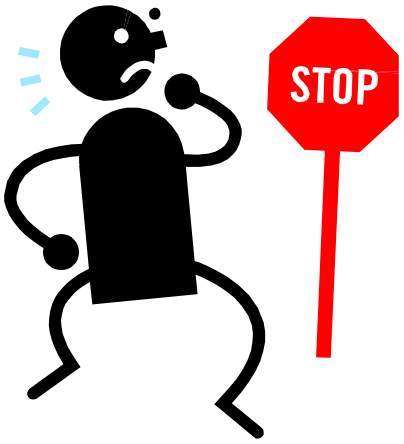
Programming	Every person involved meet together to have a BIM Kick-off meeting where information is shared on how to work as a team. This information is later transformed to a document called a BEP (BIM Execution Plan)	Everyone starts their own model and feel that they should have meet together because Origins are off and objects in the linked files are visible when they should not.
Conceptual Design	Study of building shapes are done using various software like Vasari, Sketchup, 3DS Max. Revit used for preliminary design and analysis	Conceptual Design is done directly in Revit because we need elevations and plans quickly, after all, it is a fast track project (see note above…).
Detailed design	This is where we are using the full potential of Revit.	Pretty much the same here.
Analysis	Using the more advanced Revit Model we can make detailed analysis.	No time for analysis, we have to get the plans out!
Documentation	Now time to add some texts, tags and automatic Keynotes coming from our database and use plugins that allow us to transfer data to and from Excel	We use regular text, we didn't have a BIM manager to set up proper Keynoting and tags…
Fabrication	Our models go to manufacturers so items could be prefabricated to save time and money on the site…	Fabrication?

Construction 4d / 5d	Construction goes smoothly because we did it in Navisworks before hand and Prefabricated items arrive in time	Construction is going as normal, we have problems as we have on all regular construction, it's part of the construction reality, we have extra because panels don't fit on site or addendums are issued.
Construction Logistics	All steps are going well because of the Microsoft Project integration of each phases is done in Revit	All steps are going well, we have a dedicated project manager to do that. Phases in Revit?
Operation and Maintenance	We hand over the model to the client or keep it to make sure maintenance is done properly during the lifecycle of the building	We give them CAD exports from our Revit Model because we don't want them to use our own families
Renovation	Since we know the building perfectly, we are called to make other projects in it using BIM	We can bid on other project done in this building as all the other architects and Engineers can.



In a perfect world, we would start at the programming step with BIM. Starting BIM after entering the conceptual design phase is frequently the Norm. Some even as far in as Detailed design.

Where do we stop doing BIM in the projects?



The plans have been printed and given to the contractor, so let's do another project shall we? That's what's happening in real life. The rest is normal construction site management right? What's the value in continuing in BIM? It usualy stops at the documentation step on the wheel image. Very few firms go to fabrication with the model. Why? Because of the lack of knowledge and communication with fabrication shops and subcontractors. They should be implicated in the kick-off meeting to plan ahead with the conception team. BIM should be part of the construction logistics but seldom is, due to inapropriate usage Revit Phases and improper BIM project management. clients ask for 3d model, but the majority of them don't even know what to do with them.. so we can forget about maintenance.

Fast track Projects: This is highly incompatible. How can you analyze your building with studies (solar, air and wind), interference checks and virtualization when the project is being built at the same time as you are modeling?

True Collaboration: We call it working on a "Live model". Everyone is linking the central model of the other disciplines.

After synchronizing and reloading we see the changes. As soon a problem arrives, everyone knows it and we can make changes or coordinate without waiting.

Benefits of BIM :

First, make sure you have a BIM execution plan. Here is the table of contents created for a 40 storey tower project in Montreal.

MSDL

ZENIT Consultants

YUL

CONDOS | MAISONS DE VILLE

1400 René-Lévesque Ouest

Projet : 1113

Plan de Gestion BIM

PROCAD CONSULTANTS Prototype T4.0-120

BIM Deployement Plan

TABLE OF CONTENTS

TABLE OF CONTENT

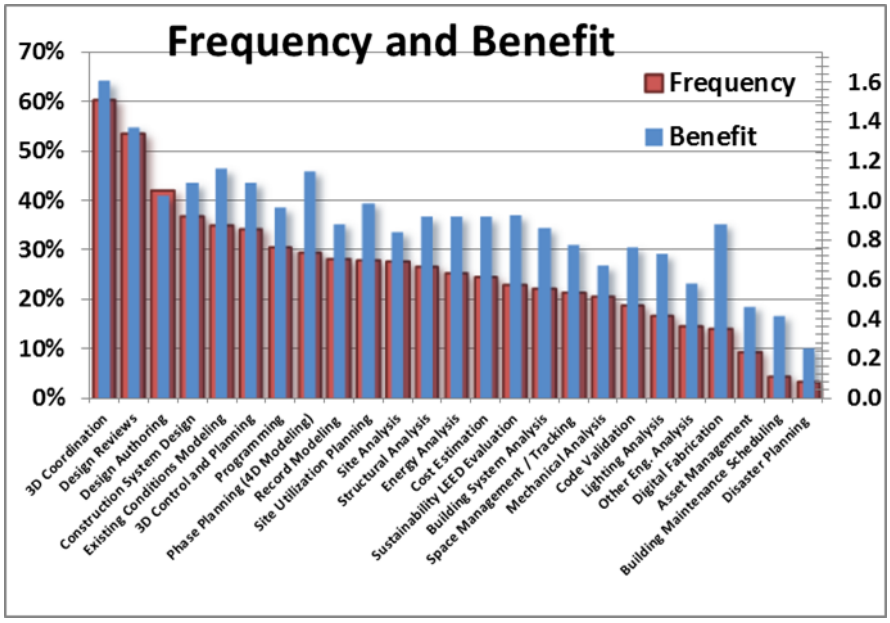
Auteur des éléments du modèle / Model Element Author (MEA)	
Abrev	Disciplines - Model Element Author (MEA)
A	Architecture / Architecture
D	Design Interieur / Interior Design
SM	Structure - Métal / Metal
SB	Structure - Béton / Concrete
M	Mecanique / Mechanical
E	Électricité / Electric
P	Plomberie / Plumbing
C	Civil / Civil

NIVEAUX DE DÉTAIL CLÉS / LEVEL OF DETAIL KEY	
LOD	DESCRIPTION
100	Volume global, analyse sommaire du bâtiment complet (volume, orientation du bâtiment, coût
200	Systèmes Généraux et Assemblages avec quantités, dimensions, formes, localisation et orien
300	Documentation de construction, Dessins d'atelier. Simulation autorisée pour certains éléments
400	Pour Fabrication et Assemblage. Niveau de détail pour entrepreneurs et fabricants / Fabricatic
500	Tel que Construit. Opérations de Gestion des Installations / As-Built. Facility Management Op

Code	Description	MODÈLE / MODEL	DONNÉES DATA	Développement Conceptuel / Conceptual Development					Développement du Design / Design Development					Final Coordination / Coordination finale				
		Y/N	Y/N	100	200	300	400	500	100	200	300	400	500	100	200	300	400	500
A	**INFRASTRUCTURE / SUBSTRUCTURE**																	
A10	Fondations / Foundations																	
A1010	Fondations standards / Standard Foundations	Y	Y		A						SBfA					SBfA		
A1020	Fondations spéciales / Special Foundation																	
A1030	Dalle inférieure / Slab on Grade	Y	Y		A						SBfA					SBfA		
A20	Construction du sous-sol / Basement Construction																	
A2010	Excavation du sous-sol / Basement Excavation																	
A2020	Murs du sous-sol / Basement Walls																	
B	**SUPERSTRUCTURE ET ENVELOPPE / SHELL**																	
B10	Superstructure / Superstructure																	
B1010	Construction de plancher / Floor Construction	Y	Y		A						A					A		
B1020	Construction de toiture / Roof Construction	Y	Y		A						SMA					SMA		
B20	Enveloppe extérieure / Envelope																	

Most notable benefits for using BIM:

- Better collaboration
- Less mistakes
- Automation and Parametric
- Improved Decision making
- Not really quicker but can give more!
- Reduced numbers of RFIs
- Computations and automatic schedules



(www.psu.edu)

Conclusion: BIM is a reality, a process that cannot be denied. To make sure that this automation is efficient (Revit), we must make sure that the process is without any defect. Enter the BIM Manager, the key to making all this work.

Describe issues associated with Starting a BIM project

Owners on board.

You can have the greatest training and implementation available. The most amazing support from resellers and consultants. An amazing group of open minded, well trained, enthusiastic professionals. The best IT infrastructure and workstations money can buy, with more ram than a dodge dealership. None of this can help you if you don't have the support, leadership, and understanding of an owner that Believes in BIM. This conclusion comes from having the Implemented over 70 AEC firms from CAD to BIM. Excitement and hype is not enough. Excitement passes with time, and Hype ends up on the shelf.

Resisting change

One of the greatest hurdles to overcome when starting a BIM project, are team members that do not believe in the process (BIM). Let's face it, it's in our nature to resist change. AutoCAD was first released in 1982. Did it take off immediately? No, there was resistance. Those who believed and embraced AutoCAD early on reaped the benefits. The skeptics paid the price, playing catch up down the line.

"The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency"

- Bill Gates

Example: Let's take section an elevation bubbles for example. Having annotations reference themselves is what puts Revit (BIM tool) ahead of conventional CAD… right? Wrong. Sheet Sets can do this, they have been around since AutoCAD 2005 which was released in 2004. The same thing can be said for commands like annotative scaling and data extraction tables.

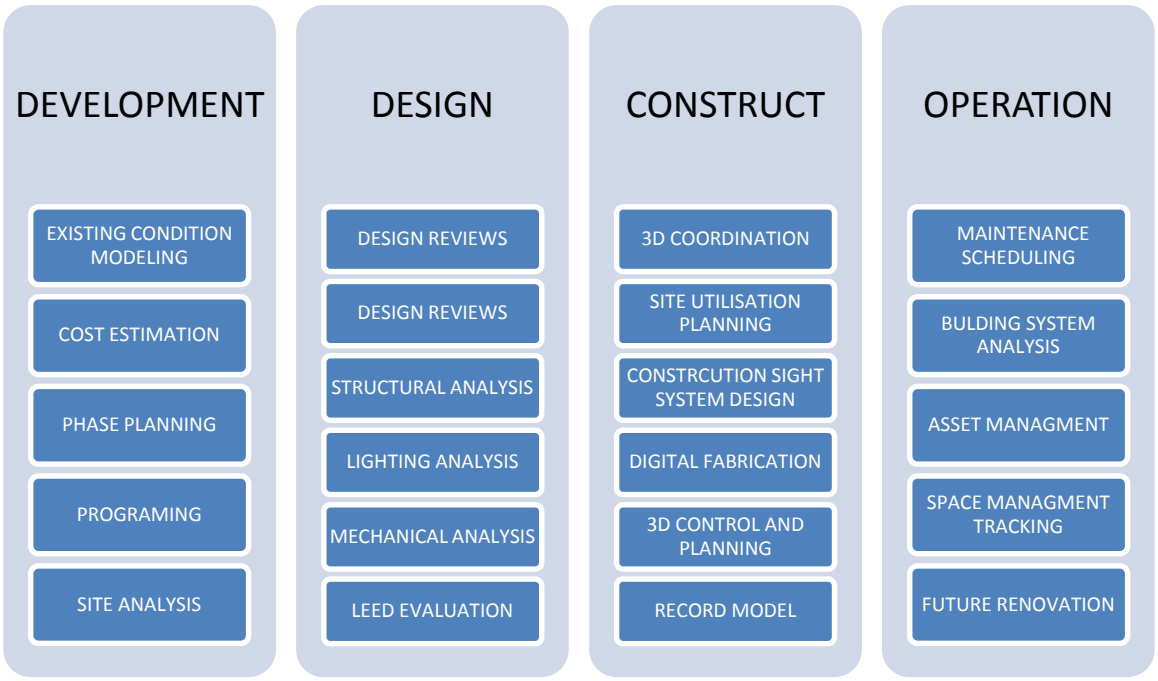
IT considerations

More often than not, companies commit to a BIM implementation without even checking if their hardware and IT infrastructure can handle it. Your design team is only as efficient as the machines they control. BIM managers use different techniques to improve model performance and stability, but you need to at least have the recommended system requirements.

Implementation Templates and content needs to be assembled. Roles and responsibilities need to be established and delegated. At this point team members should be trained on the chosen BIM tool. BIM Protocols, BEP, and BDP should be established.

Uses

BIM usages and offerings need to be defined in the BEP and BDP.



Kickoff meeting and BIM Committee

Kickoff meetings are a great way to get all parties started on the path to success. Roles are defined, responsibilities are delegated and LOD's are established. A BIM Committee should be established. This committee will identify the elements that could be potential obstacles, discuss current issues/problems, modeling strategies, workflows, and supply feedback to the BIM manager. This feedback gets documented and integrated into company protocols.

Leap of faith

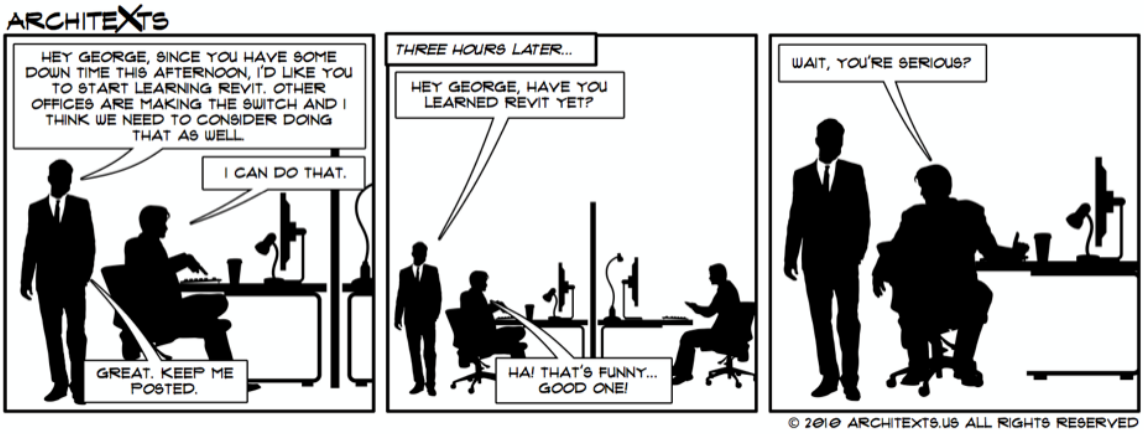
Time to start the project. No going back now. You need to rely on the Best practices and skills learned in your training. Leverage support from resellers and consultants if required.

Use knowledge and skills to create a company deployment plan and BIM Execution plan.

Before undertaking tasks, we need to concentrate and think before acting!

"The general who wins the battle makes many calculations in his temple before the battle is fought. The general who loses makes but few calculations beforehand."

...Sun Tzu



What is a deployment plan?

This is a document containing Strategies on how to implement a BIM Solution into your office.

- Find a Project on which you are going to be working on BIM.
- Evaluate the number of people needed
- Choose the right people
- Look at the existing CAD standards and usual paper output for plans.
- Study the standards and work on making new Revit Standards (redisign or use old CAD designs).
- Train the users for the aforementioned project
- Follow up and make corrections to standards during and after the project.
- From the beginning, write and update the written document that will become the Revit Standards Manual

The Revit Standards Manual

In this manual, you'll find all information concerning

- Organizational charts, flow charts, and more charts
- Naming conventions
- Text, tags, titleblocks, dimensions, legends standards
- Worksets, phasing and design options usage and conventions,
- Typical Schedules
- Door types, Window types,
- Keynoting, Shared parameters, materials
- Etc..

What is a BIM Execution Plan?

Passive or Active?

Usually it is tied to a specific project. The main difference between a BIM execution plan (BEP) and a BIM deployment plan (BDP) is that the Deployment plan concerns the integration of a BIM solution into your office. It's a roadmap to a smooth well documented transition. The BIM execution plan encompasses the details concerning a specific project. Deployment is on a general level and Execution plan is on a project level. Each office should have a deployment plan and each project should have a BIM Execution Plan.

Many documents can be found on the internet to help you build a BEP. That's what I did… I used the Penn State BIM execution plan. More specifically, the UK AEC BIM Plan and other sources to compile an Execution plan that suited my needs. Penn state was a bit too complex and specialized for what I needed, other documents did not have enough information. In the end my final product was a hybrid tailored to my needs. The important thing to remember is that there is an abundance of resources available to use for the creation of a BIM Execution plan.

But why do I need a BEP? Is it just another document that will find itself on the shelf , weeks after its completed? Well yes and no, it becomes the reference for the project so it has to be on everybody's shelf for consultation. It is all about collaboration:

BIM Execution Plan Definition :

The BEP is a detailed plan that allows us to define the way that the project will be executed and controlled having BIM in mind. It establishes modeling standards, common strategies and leads us to achieve our BIM goals defined by all professionals in the project.

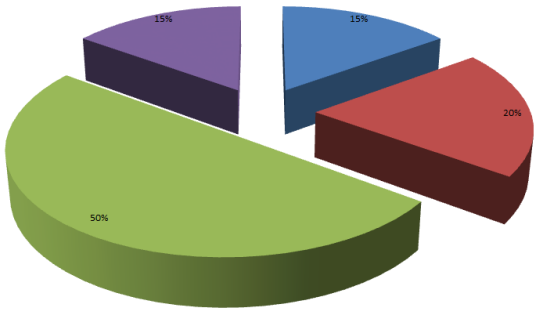
*This document should be tied to the contract somehow.

4 Different sections :

What, Who, How, Which tools!

What kind of information can be found in this kind of document? The table of contents addresses some basic questions:

What? (20%)
Who? (15%)
How? (50%)
Which tools? (15%).



Source : Contect Conference, BIM Projects 2013, Speakers : Aldo Antillon, Christian Glaude, Franck Murat.

http://contech.qc.ca/grandes-rencontres/bim-24sept-2013

What ?: Description of the project, objectives and goals.

- Objectives must be measurable and project specific,
- They must affect the project performance by reducing the schedule, the cost or magnify the quality of the project.

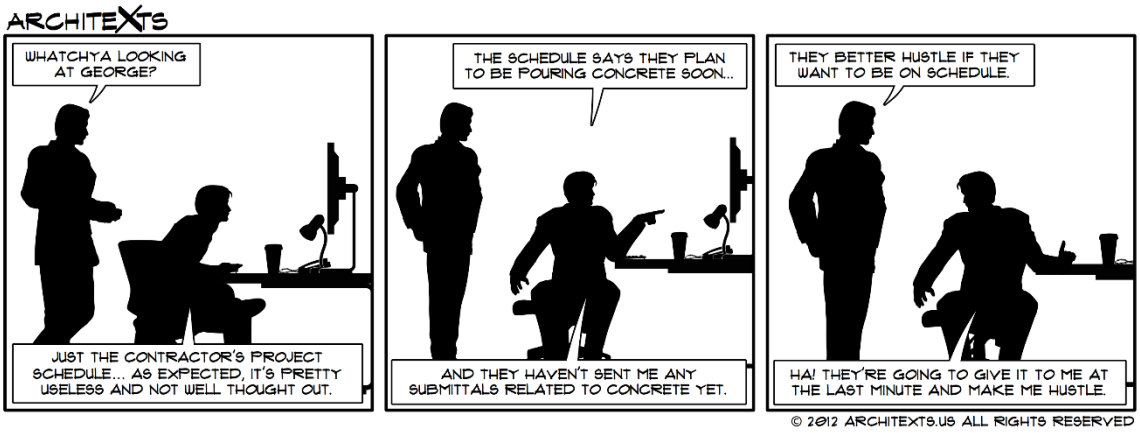
Project description : An easy one; this is where you put address of the project, its size, estimated date of completion, project manager, architect, engineer and consultants firms etc…

BIM Objectives : What is the objective we have for BIM, are we doing 5d? 6d? or only 3d or 4d? Are we going all around the circle or only taking a few steps…?

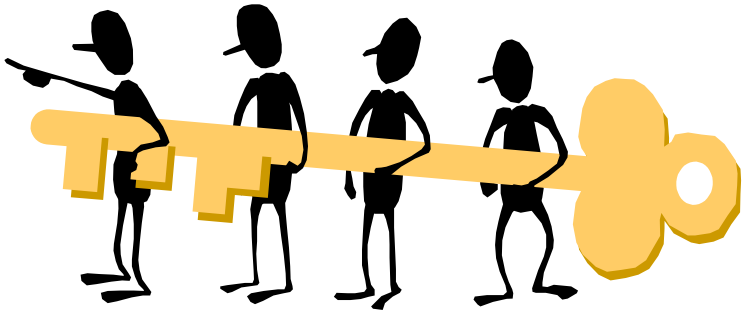
Deliverable's : What do we have to submit in the end? Paper? CAD only? Revit Model? DWFs? PDF?

Project Schedule : This one is very important, what are the important dates of the project?

Phase	Objectives	ARC	STR	MEC	ELE	PLB
3D Modeling	Use Revit to generate all 2d delivrables.	☒	☒	☒	☒	☒
	Use Revit to produce all automatic material schedules.	☐	☐	☐	☐	☐
	Incorporate 3D views in the 2D delivrables.	☒	☒	☒	☒	☒
3D Annotation	Use Design Review for internal coordination between Engineers and Architects.	☐	☐	☐	☐	☐
	Use DWF as a unique format.	☐	☐	☐	☐	☐
	Use Revit for clash detection for same discipline.	☒	☒	☒	☒	☒
	Use Revit for clash detection between discipline.	☒	☒	☒	☒	☒
4D Sequences	Phases are linked to calendar and visualise sequence in Navisworks.	☐	☐	☐	☐	☐
	Use Phases simulation to analyse different options.	☐	☐	☐	☐	☐
5D Cost	Put a cost on all construction elements in Revit to generate cost estimations.	☐	☐	☐	☐	☐
	Use Revit models to support operations	☐	☐	☐	☐	☐

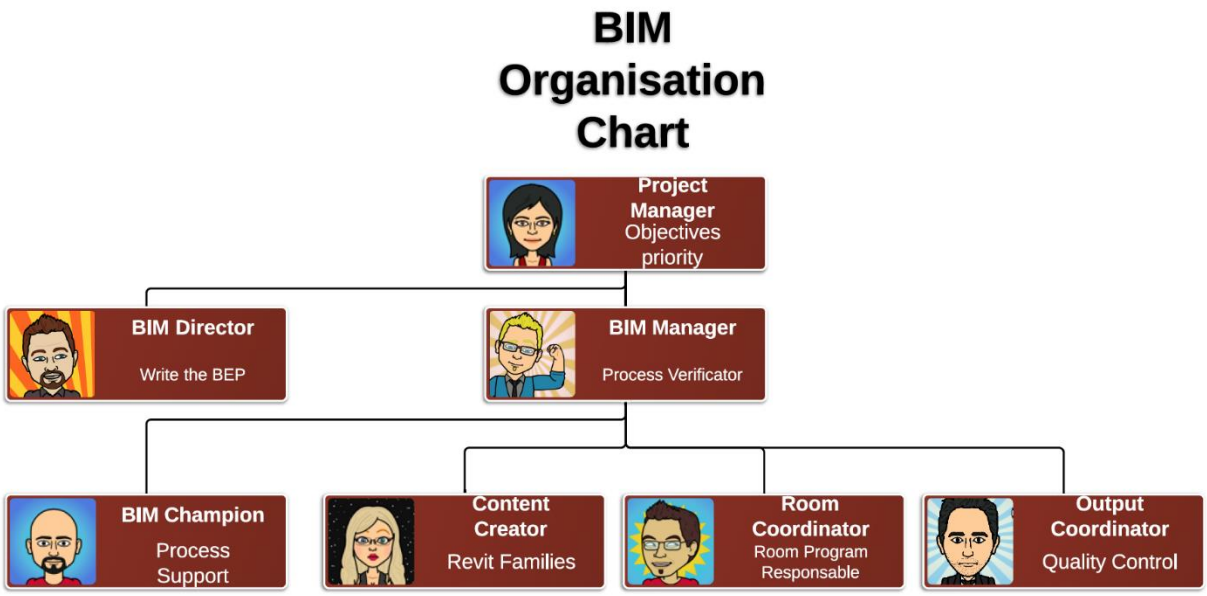


Who ? : Who are the key players?, Their responsibilities?, their roles? This is where we find all information on the players!

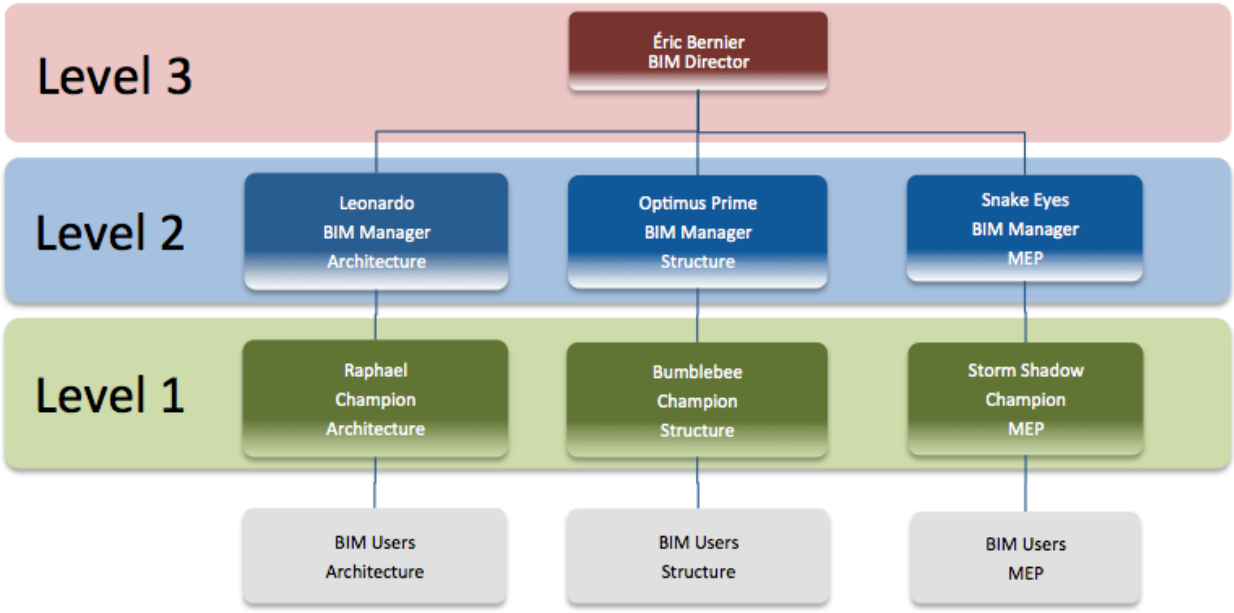


Roles and responsibilities : What does a Revit Champion do? What about a content creation specialist? Or a BIM Manager? A table with all useful information, email addresses and full contact info and responsibilities is usually included in BEPs.

BIM Organization chart : Where are we on



Support levels : A BIM Manager has a lot of things to do and first level support is not one of them. Users must know to whom ask a question to get proper support.



How ? : Strategies

Modelling and data strategies :

- Where do we split the model to make the files smaller,
- How are we doing that weird shaped conference center?
- Are we doing the details in CAD or Revit?
- **Linking models** : How are we linking the files together? Origin to origin? Shared Coordinates? If so, which file is the reference?
- **Data organization** : How are the folders organized?
- **Access rights** : Who has access to them?
- **Files** : How do we name other files? Do we include the creation date? How do we name the archive files?
- **Parameters** : How should we be naming the Parameters?
- **Shared parameters** : List of all the shared parameters and their purpose.
- **Best Practices** : We all have our little shortcuts and homemade tools that ease our workload. This is where the procedures to use them would be documented.

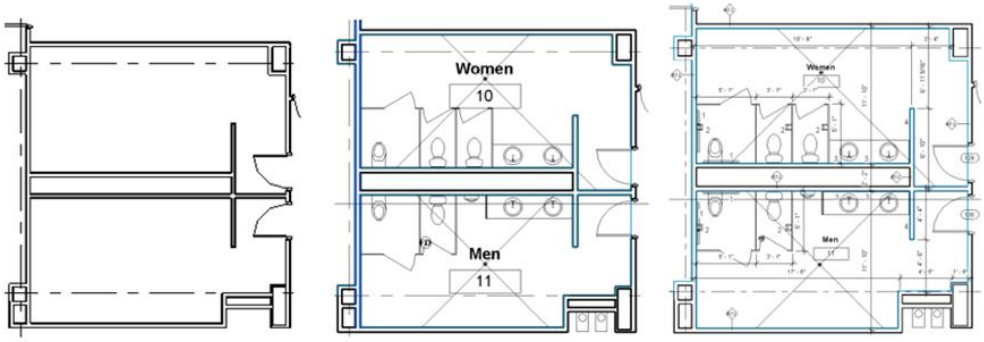
Collaboration Strategies:

- **Naming conventions** : How do we name the Revit models? What about families? Don't forget Forbidden characters?
- **Worksets** : How should we name the Worksets? Can the naming convention help when modeling and managing links?
- **Grids and levels and origins**
- **Sheet numbering** : Explain sheet numbering strategy
- **BIM Meetings schedules** : Fixing a recuring date to make sure everybody meets on a regular basis.

Communication rules : When I send an e-mail to someone, who should I include in my CC?

Visualization Strategies:

- **LOD** : How much do we model? Door moldings, dead bolts? Really?



Level 100 Floor Plan *Level 200 Floor Plan* *Level 300 Floor Plan*

- **View templates** : This is an amazing tool for BIM Managers! (should have a feature to export all the settings to a word or excel format for documentation because it is hard to note everything).
- **Title blocks** : What do they look like? List them and describe its usage.

Quality Control Strategies:

- **LOD** : How much do we model? Modeling door moldings? Really?
- **Clash Detection** : Revit, Navisworks?

Which tool : Hardware, software, network speed, etc…

BIM Tools and software : Here, all the team agrees on a version and stick to it until the end of the project. We are also looking at different plugins solutions such as database transfer or deeper exploration tools, family classification, etc…

Hardware : We can see all the info on the computers used on the project…

Network : Make sure it is a 10gbps network…

Model / Processor	Dell Precision T7500 Six Core Intel Xeon X5690 3.46GHz,12M L3,6.4GT/s
OS	Windows 8 Professional w/64-Bit media French
RAM	48Gb 1333MHz DDR3 SDRAM ECC 6X8GB
Discs	256GB Solid State Drive (SSD)
DVD	16XDVD/Rom w/ CyberLink PowerDVD
Video Card	NVIDIA Quadro 4000 2Gb w/ Dual Monitor

Now : How to get there!

As a BIM Manager, you have to be on that **BIM kick-off meeting** and make sure that everybody understands how important this is. The hard part for BIM Managers is to circumvent the difficulty to get there because our role is new, but we have to be there!

At this table you have to get everyone involved and participating : The client, the architects, Engineers, the project managers, the BIM Managers from all disciplines, the BIM Director for this project…

Goal of this meeting : Get a schedule to create this BEP. It is very important to look at previous projects done by the various participants and make sure to listen to the BIM Director's advices, he should be the most experienced BIM Strategist around the table.

Without going in too much details (this should be another course)! Here is a few pointers to look at :

- Origin system (Origin to Origin or shared coordinates).
- Grids and levels
- LOD
- Worksets

- Architecture and plumbing issues
- Architecture and Electricity (for Caseworks and furniture)
- Columns
- Phases
- What have to be scheduled
- Costs?
- Revisions and Printing
- Clash detection and coordination
- And so on!