

Building Information Modeling Project Execution Plan

Executive Summary

The BIM Project Execution Plan seeks to optimize technology utilization, and interoperability across the entire project team in order to improve control over quality, cost, and schedule. The planning effort should be initiated at the earliest possible stage of the project, and every effort made to convey the value of BIM to all stakeholders.

This document is a collaboration among the technical leads from each discipline that will establish specific workflows and record strategic decisions about many technical aspects of the modeling environment within the context of this project's specific goals and constraints, as established by the stakeholders.

Where **AIA documents E203, G201, or G203** are in use, the content of those documents must be coordinated with this *BIM Project Execution Plan*.

1 – Project Information

The project information should be as comprehensive and detailed as possible in order to fully inform the team. Attach additional documents as appropriate.

1.1 – Project Number and Name

00001

ProjectName

1.2 – Project Description:

New / Existing / Renovation

Construction Type

Contract Type

Client/ Use Group

Number of Buildings/ Stories / Height (Feet + inches)

Area (Gross / net)

1.3 - Project schedule

- Schematic Design completion – MM/DD/YYYY
- Design Development completion – MM/DD/YYYY
- Construction Document completion – MM/DD/YYYY
- Special Phasing/ Document Packaging

1.4 – Project Location

The location should be set in Revit to enable accurate energy and lighting analysis.

Street Address

Latitude / Longitude: 00.0000, 00.0000

1st floor FFE = (Feet + inches) above sea level

1.5- Project Team – Model Managers

This position is concerned with both quality control and technical support in the management of the Revit model, coordination of the design team, and compliance with the BIM Execution Plan over the life of the project.

Firm	Discipline (prefix)	Model Manager	Phone	Email
SLAM	Architecture (A_)	Name	Phone number	Email address
	Architecture (A_)	Name	Phone number	Email address
Firm name	Structure (S_)	Name	Phone number	Email address
Firm name	Landscape (L_)	Name	Phone number	Email address
Firm name	Civil (C_)	Name	Phone number	Email address
Firm name	M/E/P/FP (M_)	Name	Phone number	Email address
Firm name	Technology (T_)	Name	Phone number	Email address
Firm name	Cost Estimation	Name	Phone number	Email address
Firm name	Other	Name	Phone number	Email address

2 – Deliverables

Identify deliverable required for this project along with the party(s) responsible for their creation, and the software that will be used to create them, and the phase(s) that they will be generated in.

2.1 Existing Conditions Documentation

Scope	Format	Author/ Date	Responsible Party
Full/ Partial/ Site/ Building	PDF/ Paper/ CAD	XYZ/ 00/000	Owner
Full/ Partial/ Site/ Building	Revit Model		Owner
Full/ Partial/ Site/ Building	Scan to BIM		Owner
Full/ Partial/ Site/ Building	Other		Owner

2.2 – Pre-Design

Deliverable	Software	Responsible Party
Programing	Software	Firm name
Site Analysis	Software	Firm name
Massing/ Area Analysis	Software	Firm name
Concept Modeling	Software	Firm name

Solar Analysis	Software	Firm name
Cost Estimating	Software	Firm name
Visualization	Software	Firm name
Other	Software	Firm name

2.3 – Design – SD/ DD/ CD

Deliverable	Software	Responsible Party
Architectural Model	Software	SLAM
Lighting Analysis	Software	Firm name
Visualizations	Software	Firm name
Animations/ Walkthroughs	Software	Firm name
Photorealistic Renderings	Software	Firm name
Room Data Sheets	Software	Firm name
Structural Model	Software	Firm name
Structural Analysis	Software	Firm name
Structural Detailing	Software	Firm name
M/E/P/FP Model	Software	Firm name
Energy Analysis	Software	Firm name
Site/Civil Drawings	Software	Firm name
Landscape Drawings	Software	Firm name
Technology Drawings	Software	Firm name
Quantity Takeoff	Software	Firm name
Specifications	Software	Firm name
Cost Estimating	Software	SLAM CSS or Other
Visual Clash Detection	Native Modeling Software	All Firms
Clash Detection	Navisworks	CM/ Contractor
Other		Firm name

2.4 – Construction/ Commissioning/ O & M

All *facilities data* requirements, standard, and formats must be explicitly documented by the owner at the outset of the project.

Deliverable	Software	Responsible Party
Site Logistics	Software	Firm name
Procurement/ Cash Flow	Software	Firm name
Construction Sequencing	Software	Firm name
Pre-Fabrication	Software	Firm name

Scheduling	Software	Firm name
RFID Tagging	Software	Firm name
As Built Documentation	Software	Firm name
Facilities - As Built Model	Software	Firm name
Facilities - COBie Data	Software	Firm name
Facilities - Asset Data	Software	Firm name
Facilities – Space Data	Software	Firm name

3 – Model Standards

All items below should be discussed with the team and modified as needed within the context of this project’s goals and constraints. New items are encouraged.

3.1 – Number of Models and Model Scopes

Break the project down into the most efficient number of models and describe their scope in broad terms. Each separate building requires a separate Revit model to facilitate level and rotational changes.

Discipline	Scope	File Name
Architecture	Building 1 - Core and Shell	Discipline-Number-Name-Scope-Version.RVT
Architecture	Building 1 - Interior	A_12345_AcmeHealth-B1-Interior-R19.RVT
Architecture	Site/ Context	A_12345_AcmeHealth-Site-R19.RVT
Architecture	Garage	A_12345_AcmeHealth-Garage-R19.RVT
Structure	Building 1 Structure	S_12345_AcmeHealth-B1-R19.RVT
Structure	Garage Structure	S_12345_AcmeHealth-Garage-R19.RVT
M/E/P/FP	Building 1 MEP	M_12345_AcmeHealth-B1-R19.RVT
M/E/P/FP	Garage MEP	M_12345_AcmeHealth-Garage-R19.RVT
Site/Civil Model		C_12345_AcmeHealth-Site-R19.RVT

3.2 - Revit Standards

Linking:

- All Revit models are to be linked *Origin to Origin*. *Shared Coordinates* are generally not used, except for the *site* and *building* models where it is used to position the site in the building model, thereby setting the *Shared Coordinate* system to provide correct sea level elevations. In this case, the shared coordinates may be *acquired* from the architectural model in order to report sea level elevations in other models.
- Set linked files to be *Room Bounding* in their *Type* properties
- DWG Linking – Linking of DWG files should be kept to an absolute minimum, to preserve project performance and maintain reasonable files sizes. Never *Import* CAD files.

- View linking – On a project-by-project basis, the Architectural model may include views that are intended to be used as “background” views, or “coordination” views by consultants, with Visibility/Graphics across the link set to “By Linked View.”
- Pin all linked files.

Project Coordinate System:

- Levels shall report the *Project* coordinate system elevations
 - Spot Elevations can be used to report the sea level elevations as needed.
- The building first floor *Level* shall be placed at 0' – 0" in the Project coordinate system.
- Buildings are to be modeled orthogonal to the *Project* coordinate system (X,Y)
 - *Scope Boxes* are to be used to rotate views of angled areas of the project orthogonal to the sheet.
- The *Project Base Point* should not be moved.

Levels & Grids:

- Assign Levels and Grids to *Scope Boxes* to manage their visibility.
- Pin all Levels and Grids.

Model Groups

- A documented strategy for the use of groups should be developed that addresses the group content, element hosting within the group, group origin, and naming.

Design Options

- A documented strategy for the use of Design Options should be developed that addresses the scope, location, naming, content, and duration of each option set and options within it.
- Create dedicated views to display *Design Options*, and name them according to the option they display. Never force documentation views to display a *Design Option*, but rather, leave them set to *Automatic* so they display the *Primary* option.
- Design Options should be resolved prior to CDs, if not earlier.

Worksets:

Adhere to a consistent naming format that describes their scope, purpose, and author/ owner.

- Architectural Model:
 - Shared Levels and Grids – All Levels and Grids
 - Workset1 – Default Workset for content not specified below
 - Structural Coordination Elements
 - Linked Revit - *Discipline* – One for each linked Revit model
 - Furniture – All Furniture (not visible in all views)
 - Entourage – All rendering entourage (not visible in all views)
 - Finish Floors – All finish floor (not visible in all views)
- Structural Model
 - Shared Levels and Grids – Levels and Grids
 - RVT Links – Linked models
 - **As defined by structural consultant**
- MEP Model
 - Shared Levels and Grids – Levels and Grids
 - RVT Links – Linked models
 - **As defined by MEP consultant**
- Food Service Model

- Shared Levels and Grids – Levels and Grids
- RVT Links – Linked models
- As defined by food service consultant
- Technology Model
 - Shared Levels and Grids – Levels and Grids
 - RVT Links – Linked models
 - As defined by technology consultant

Phasing:

- Existing – no work in this phase
- New Construction – all work in this phase
- Additional phases as required by project specifics, but not for demolition.

Dimensional tolerances:

- All objects are to be modeled precisely by using *Snaps* and specifying exact dimensions (never nudge or drag). This is particularly important for reference objects like Levels and Grids.
- Dimension *Annotations* are set to 1/256 but may be rounded as coarse as 1/16" if required.

3.3 – Quality Control Model Review

Each Model Manager will be responsible for running quality control checks on their model(s) on a consistent basis (milestones at a minimum). For issues involving other disciplines, the issue shall be made known to the corresponding Model Manager. A short list of QC criteria includes:

- | | | |
|----------------------|---------------------|-------------------|
| ● Naming Conventions | ● Linked Revit | ● Visual Clash |
| ● Auditing | ● Linked CAD | ● View Templates |
| ● Compacting | ● Images | ● Loaded Families |
| ● Warnings | ● In-Place Families | ● Levels & Grids |
| ● Worksets | ● Coordinates | |

3.4 - Level of Detail

Design Development - The level of detail for all elements in all models, at the final model exchange of the DD phase, should correspond to "LOD200" as defined in AIA document "E202-2008."

Construction Documents - The level of detail for all elements in all models, by the model exchange for 50% CD and every exchange thereafter, should correspond to "LOD300" as defined in AIA document "E202-2008."

These general levels of detail may be more comprehensively defined in Appendix 1 – Specific Level of Detail by Phase and Category. The requirements of Appendix 1 will take precedence over the Level of Detail as defined by the E202 document.

4 – Workflow and Process Mapping

4.1 – Revit Coordination Workflows

- 4.1.1 - Levels and grids:
 - All levels and grids are established in the Architectural model. Structure and MEP may use the Copy/Monitor tool to bring those elements into their files for monitoring over the life of the project.
 - Additional grids and levels, if required on a multidisciplinary basis, will be created in the Architectural model and then Copy/Monitored to other files.
 - Additional grids and levels required by only one discipline will be created as needed but must be named in accordance with the grid and level naming format established by the Architectural model
- 4.1.2 - Floors
 - Floors and Shaft Openings will be created in the Architectural Model (correct thickness, single material), and concurrently in the Structural model (accurate deck and slab included). Over time the Architectural model will display only the elements from the structural model.
 - The Architectural model will take the lead in establishing edges of slabs, which will be followed by the Structural model matching those slab edges at defined intervals throughout the project.
- 4.1.3 - Walls
 - Foundation walls may be created in the Architectural Model as required to enclose any sub-surface levels. Subsequently, the Structural Model will create engineered foundation walls, at which point the corresponding architectural walls will be moved to the Workset named “Structural Coordination Elements” in the Architectural model.
 - **Bearing and/or lateral bracing walls will be created in the Architectural Model as required to design the interior of the building. Subsequently, the Structural Model will create engineered walls, at which point the corresponding architectural walls will be moved to the Workset named “Structural Coordination Elements” in the Architectural model.**
- 4.1.4 - Roofs
 - Roofs and roof openings in the Architectural Model will represent the roof assembly above, but not including, the metal deck. The Structural Model will include the roof support steel and metal deck.
 - At locations where sloping steel is used, the Architectural Model will initially include a flat roof until the support steel is established in the Structural Model, and then the roof will be edited to match the correct slope.
- 4.1.5 - Plumbing fixtures
 - In the Architectural Model, selected 3D Plumbing Fixture families, such as toilets, sinks, showers, and roof drains, will be created that are correctly located in 3D space. The M/E/P Model will create Plumbing Fixtures that connect to the architectural Plumbing Fixtures and extend piping systems from them, correctly located in 3D space. Additionally, plumbing and fire protection systems which are not located by the architectural model should be fully modeled in the M/E/P model.
- 4.1.6 - Ceiling and Wall Mounted M/E/P items

- This subsection applies to items which require the architect to determine the placement of an item which is part of the M/E/P scope of work. This includes but is not limited to lighting fixtures, air terminals (i.e. diffusers), radiant panels, chilled beams, recessed projection screens, etc.
- In the Architectural Model, selected families will be created that have no 3D geometry, except for an Opening if ceiling based, and an “attachment plane” to facilitate the use of face-based families in the M/E/P model. Otherwise, these families will consist only of 2D Symbolic Lines which will be visible in the architectural reflected ceiling plan. The M/E/P Model will create 3D families and locate them based on the Architectural Model, and as additionally required.
- For M/E/P items which are recessed in the ceiling, the M/E/P model should use face-based families and select the “attachment plane” of the corresponding architectural family as the host. Recessed M/E/P items should be modeled at their true size above the ceiling plane.
- For M/E/P items which are surface-mounted on the ceiling, the M/E/P model should use face-based families and select the architectural Ceiling as the host. If there is no ceiling, the M/E/P model can use face-based families and the underside of the structural floor as the host, or an un-hosted family. If an un-hosted family is used, the height of the fixture must be maintained at the correct elevation.
- For M/E/P items which are surface-mounted on walls, the M/E/P model should use face-based families and select the architectural Wall as the host. These families must be placed and maintained at the correct elevation.
- Selected M/E/P fixture families which need to be modeled at a high level of detail for display and/or rendering purposes may be created by the architecture team and then delivered to the M/E/P consultant for use in their model. The M/E/P consultant is expected to add the required engineering information and parameters to the families.
- 4.1.7 - Rooms and Spaces
 - In the Architectural Model, all areas of the building will have associated Room objects, at all relevant phases.
 - The M/E/P Model will follow the room naming convention to create Space objects.
- 4.1.8 – Scope Overlaps and Transitions
 - This chart can be used to record phase transitions of scope overlaps

Scope	SD	DD	CD
Core and Shell	Architect	Architect	Architect
Interiors	Architect	Architect	Architect
Levels	Architect	Architect	Architect
Grids	Architect	Arch./ Struct.	Arch./ Struct.
Slabs	Architect	Arch./ Struct.	Structural
Columns			
Beams			

Sheer Walls	Architect	Arch./ Struct.	Structural
Roof Structure			
Roof Ins./ WP			
Slab Edge			
Stair Edge			
Plumbing Fixt.			
Ceiling Fixt			
Power and Data			
Grade Elevations			
Hardscaping			
Utilities			

4.2 – Clash Detection and Resolution Workflows:

- No formal (i.e. automated tool-based) clash detection will be performed during the Design Development phase. It is expected that all disciplines will seek to coordinate their own systems with other systems in the building as much as is practical.
- At regular intervals during Construction Documents, a formal clash detection exercise will be performed. Each team will use 3D and section views as well as the Revit “Interference Check” tool to identify clashes between Architectural, Structural, and M/E/P models. Necessary changes will be communicated to the appropriate parties, and discussed at the coordination meetings
- In addition to those regularly performed Interference Checks, it is highly desirable that a full clash detection with Navisworks be performed by a qualified project team member, CM, or the contractor prior to completion of the CD phase.

4.3 – Coordination Meeting Schedule and Platform:

- The team should determine a schedule for coordination meetings and select a common platform, such as Skype, GoToMeeting, WebEx, or other service.
- The coordination meetings should follow closely after the QC reviews by each firm.

4.4 – Cloud Collaboration:

- Where two firms are required to work concurrently in any *Central File*, that file will need to be hosted on an Autodesk BIM 360 Design Hub, hosted by the appropriate firm, and Collaboration for Revit licenses will be required for each active Revit modeler. There are additional licensing fees required by Autodesk.

4.5 – Secure File Transfer

- Verify that the appropriate electronic file disclaimers have been signed by all recipients of our electronic files.
- The lead architect will typically assume responsibility for providing secure file exchange services with individual user rights management, automatic notification, and tracking of file transactions.
- Files shall be uploaded on a weekly basis, by end of day every Friday during the project duration. Prior to major deliverables (i.e. DD documents and CD documents), files will be posted at agreed-upon dates not less than two weeks prior to the deliverable due date.

- SLAM's Information Services group provides *ShareFile* when requested by the project lead, who then becomes the administrator for the project specific *ShareFile* sites' folder tree, and is responsible for managing user invitations, automatic notifications, folder structure and folder rights. *ShareFile* provides the capability to automatically notify the BIM Managers every time a new model is uploaded by the team. Please verify your *ShareFile* settings or coordinate with SLAM to enable these notifications.
- The internal file transfer workflow for SLAM is to *copy* the outbound files to the appropriate consultant folder in the *80-InOut\01-TO* folder and transfer them from there. Inbound files are placed in the appropriate consultant folder under the *80-InOut\02-FROM* folder from which they can be copied to other locations for linking or other purposes. Do not edit or link any of the files in these In/ Out folders.
- Please verify proper File Naming, File Versions, and File Formats before uploading.
- BIM Managers will have the responsibility to upload and download models as needed throughout the project's life.
- To optimize Revit performance, all posted files should be detached, purged, compacted, have unnecessary links removed, and unnecessary views and sheets deleted.
- DWG files will not be provided by the Architectural team for use as backgrounds by any consultants.

4.6 – Graphic Process Map (in progress)

4.7 – Process Mapping Documents

Phase	Owner	Architect	Engineers	Contractor
Pre-Design				
SD/ DD				
CD				
Agency Review				
Bidding				
Construction				
Commissioning				

5 – Model Ownership

5.1 -- Architectural Revit model:

- Owned by **SLAM**. May be provided to the owner with waiver on as-is basis.
- Paper plots / PDF plots are the record documents.

5.2 -- Structural Revit model:

- Owned by [owner]. May be provided to the owner with waiver on as-is basis.
- Paper plots / PDF plots are the record documents.

5.3 – M/E/P/FP Revit model:

- Owned by [owner]. May be provided to the owner with waiver on as-is basis.
- Paper plots / PDF plots are the record documents.

5.4 – Navisworks model(s)

Appendix 1 - Level of detail per phase

[To be filled out as necessary to modify or clarify the levels of detail as defined in the AIA E202-2008 document]

A1.1 – Level of detail – Schematic design

Model	LOD narrative
	[not applicable]