Georgia Tech BIM Execution Plan Template

September

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Version 1.0

Contents

Agreement

By signature below, this BIM Execution Plan is herewith adopted and incorporated into the Agreement, dated _____, for Professional Design Services between _____ and Georgia Tech.

Owner	Date
Architect	Date
Construction Manager	Date
Structural Engineer	Date
Mechanical Engineer	Date
Electrical Engineer	Date
Plumbing Engineer	Date
Additional Party as Needed	Date
Additional Party as Needed	Date

1 Overview

The intent of this BIM Execution Plan is to provide a framework that will let the owner, architect, engineers, and construction manager deploy building information modeling (BIM) technology and best practices on this project faster and more cost-effectively. This plan delineates roles and responsibilities of each party, the detail and scope of information to be shared, relevant business processes and supporting software. ***All text that is RED is for illustrative purposes only, and should not be construed as a formalized response to this execution plan. Items in red are for reference only; items in RED should be deleted and/ or replaced with relevant project information.***

2 Project Initiation

This section defines the Core Collaboration Team, the project objectives, project phases, and overall communication plan throughout the project's phases.

2.1 Project Information

Project Name:	
Project Number:	
Project Address:	
Project Description:	

2.2 Core Collaboration Team

List all stakeholders that form the project management team below. These individuals share in the responsibility of providing oversight pursuant to validation of the project program, cost and value.

Contact Name	Role/Title	Company	Email	Phone

2.3 Project Goals and Objectives

List all project goals and objectives below.

Project Goal	Objective	Achieved if	Project Timeframe

2.4 Collaborative Process Mapping (Coordination Plan)

All stakeholders on the project are to briefly describe and identify their roles and responsibilities below. The purpose of the process map is to plan events, coordination, and the deliverables for each milestone. Role owners, described as a column will reflect their responsibilities per project phase.

	Owner	Architect	Consulting Engineers	Construction Manager	Commissioning Agent
Programming/ Pre-Design Phase					
Schematic Design Phase					
Preliminary Design Phase					
Construction Documents Phase					
Agency Review & Bidding Phase					
Construction Phase (Contractor)					
Close-out (Design Team)					
Close-out (Contractor)					

2.5 Project Phases / Milestones

This section identifies all stakeholders involved in completing project phase milestones. Start and completion dates will correspond with the approved project schedule. Stakeholders involved shall be the contributing parties assigned to those tasks within the phases for the project.

Project Phase / Milestone	Estimated Start Date	Estimated Completion Date	Project Stakeholders Involved
Programming/ Pre-Design Phase			
Schematic Design Phase			
Preliminary Design Phase			
Construction Documents Phase			
Agency Review & Bidding Phase (Contractor)			
Close-out (Design Team)			
Close-out (Contractor)			

3 Modeling Plan

Advance planning around which models will need to be created during the different phases of the project, which will be responsible for updating models and distributing them, and predetermining the content and format of models as much as possible, will help your project run more efficiently and cost-effectively during every phase.

3.1 Model Managers

Each party—such as the owner, architect, contractor, or sub-consultants—that is responsible for contributing modeling content should assign a model manager to the project. The model manager from each party has a number of responsibilities. They include, but are not limited to:

- Transferring modeling content from one party to another
- Validating the level of detail and controls as defined for each project phase
- Validating modeling content during each phase
- Combining or linking multiple models
- Participating in design review and model coordination sessions
- Communicating issues back to the internal and cross-company teams
- Keeping file naming accurate
- Managing version control
- Properly storing the models in the collaborative project management system

Stakeholder Company Name	Model Manager Name	Email	Phone

3.2 Planned Models

In the table below, outline the models that will be created for the project. List the model name, model content, project phase when the model will be delivered, the model's authoring company, and the model-authoring tool that will be used. For models that will not be used or created in your project, just leave the row blank, and add rows for model types you anticipate needing that are not already listed. ***Items in RED are listed as an example.***

Model Name	Model Content	Project Phase	Authoring Company	Authoring Tool
Architectural Model	Architectural objects, code information			Autodesk Revit Architecture
Civil Model	Topography, site utilities to within 5 feet of perimeter, hard and soft surfaces, other site objects			Autodesk Civil 3D
Structural Model	Structural steel members, bearing and shear walls, analytical structural model, lintels			Autodesk Revit Structure
Mechanical Model	Mechanical systems, equipment, load information, utilities within 5 feet of building perimeter			Autodesk Revit MEP
Electrical Model	Electrical systems, equipment, load information, utilities within 5 feet of building perimeter			Autodesk Revit MEP
Plumbing Model	Plumbing systems, equipment, load information, utilities within 5 feet of building perimeter			Autodesk Revit MEP
Energy Model	Energy data, run iterations, life cycle costing, peak loads			Autodesk Ecotect/ EQuest
Construction Model	Scheduling information, sequencing information			Autodesk NavisWorks
Estimate Model	Costing data, quantity takeoffs			Autodesk Quantity Takeoff
Coordination Model	Design Intent Models and Fabrication information			Autodesk NavisWorks

3.3 Model Components

As an aid to usability during later phases of your project, specify what the content, level of detail, and file naming structure of your models should look like.

3.3.1 File Naming Structure

Determine and list the structure for model file names and data format.

File Names for Models Should Be Formatted as:	
DISCIPLINE-Project Number-Building Number.rvt (example: ARCH-20090001-BL001.rvt). Confirm with GT.	
Architectural Model	ARCH-
Civil Model	CIVL-
Mechanical Model	MECH-
Electrical Model	ELEC-
Plumbing Model	PLMB-
Food Service Model	KTCH-
Structural Model	STRC-
Telecommunications	TCOM-
Audio Visual	AVIS-
Energy Model	ENRG-
Construction Model	CNST-
Estimate Model	COST-
Coordination Model	COOR-

3.3.2 Precision and Dimensioning

Models should include all appropriate dimensioning as needed for design intent, analysis, and construction. With the exception of the exclusions listed below, the model will be considered accurate and complete. In the table below, enter which items' placement will not be considered entirely accurate and should not be relied on for placement or assembly.

Items that Will Not Be Considered Accurate for Dimensioning or Placement
Architectural –
MEP –
Civil –
Construction –
Food Service –
Structural –

3.3.3 Model Attribute Data

The level of property information in the modeling objects and assemblies depends on the types of analysis that will be performed on the model.

Specify model and model component COBie data per the GT BIM Requirements. The team will be required to add information to the BIMs that will add value to GT's facility management systems. In support of COBie, the Project Team is required to utilize attributes within the GT BIM template to assist in generation of required information for contribution to the GT FM data structure. See Appendix 7.2 of the GT BIM Requirements.

See Section 4.2.2 of the GT BIM Requirements

See Section 4.3.1.1 of the GT BIM Requirements for COBie data requirements. The team is expected to understand data requirement for all phases of the work, and should show how data capability requirements influence the planning and collaboration for this project. Diagramming expected and anticipated events, solving workflow dynamics for the collaborative team will address the intent of the BIM project.

3.3.4 Modeling Level of Detail

Specify the level of detail in your models below. The level of detail can be defined by exclusions and/or by object size. The level of detail described here should reflect descriptions listed within the AIA E202.

Exclusions: List the objects excluded from the model in the table below.

Items that Will Be Excluded from the Model
Architectural –
MEP –
Civil –
Construction –
Food Service –
Structural –

Size: Any object smaller than [1”] will not be included in the model.

3.4 Detailed Modeling Plan

For each phase of the project, the project team should create a detailed modeling plan, which should include the modeling objectives, models included, and the roles and responsibilities of model authors. Model objectives and model manager roles and responsibilities by phase are outlined below.

3.4.1 Programming/ Pre-Design Phase

3.4.1.1 Objectives: Provide initial design based on conceptual parameters established by the owner, ensure that code and zoning requirements meet project objectives, and establish a 3D reference point of model coordination. Provide Program of Requirements and all space considerations for reference in the model.

3.4.1.2 Model Roles: A model may or may not take shape during the Conceptualization / Program of Requirements phase. If a model is created, its role will be to depict the visual concept and general layout of the project along with space requirements.

3.4.1.3 Responsibilities: The architect's designated model manager will establish a baseline model to be used as the basis for other models. During the Conceptualization / Program of Requirement phase, the model managers from all parties will establish modeling standards and guidelines.

3.4.2 Schematic Design Phase

3.4.2.1 Objectives: Provide spatial design based on input from the Conceptualization / Program of Requirement phase; provide initial design for building system and attributes including architectural, structural, and MEP; identify initial coordination issues between building systems; receive input from suppliers and fabricators regarding system cost, placement, fabrication and scheduling.

3.4.2.2 Model Roles: The Architectural model will show the general design and layout of the building structure and act as the baseline for all other subsystem designs, such as MEP and Structural models. The subsystem designs will be used to show the initial selection and layout of building components. The Architectural model and Consulting Engineers' model will be used to inform the Energy Models.

3.4.2.3 Responsibilities: Once the baseline conceptual structure has been created, the architect's model manager will send the model to the sub-consultants so they can develop their designs. The consulting engineers' designated model managers will audit and deliver the completed models to the architect's model manager. The architect's model manager will review the models to ensure compliance with the phase requirements. Once the models meet the requirements, the architect's model manager will link or combine cross-disciplinary models. The architect's model manager should coordinate with the consulting engineers' model managers to eliminate duplicate or redundant objects.

3.4.3 Preliminary Design Phase

3.4.3.1 Objectives: Provide final design of building and building systems; resolve coordination issues between building systems; provide a Construction model capable of analyzing schedule, cost, and constructability.

3.4.3.2 Model Roles: The Architectural model will continue to act as the baseline for all other subsystem designs. The subsystem designs will be modified accordingly to represent the enhanced design.

3.4.3.3 Responsibilities: The consulting engineers' model managers will use the Architectural model to revise and complete their designs. Once the models are complete, the consulting engineers' model managers will deliver their models to the architect's model manager. The architect's model manager will review the models to ensure compliance with the phase requirements. The architect's model manager will provide the construction manager's model manager with the Architectural model and the Consulting Engineers' models.

3.4.4 Construction Documents Phase

3.4.4.1 Objectives: Finalize design of the building and all building systems, prepare documentation for agency review, and provide construction modeling that highlight constructability, trade coordination, and fabrication.

3.4.4.2 Model Roles: All design models will be used to reflect the design. The models will then be used to generate the contract documents. The Construction model will be used primarily for estimating, scheduling, and constructability analysis.

3.4.4.3 Responsibilities: The architect and engineer's model managers will prepare contract documents for agency review based on the Design Intent models.

3.4.5 Agency Review & Bidding Phase

3.4.5.1 Objective: Revise Design Intent models based on agency feedback on all models.

3.4.5.2 Model Roles: The design models will be adjusted to reflect agency feedback. The Construction model will be enhanced and further used for estimating, scheduling, construction sequencing, trade coordination, and constructability analysis.

3.4.5.3 Responsibilities: The architect's model manager will communicate agency comments back to the design team. The consulting engineers' model managers will revise their design models accordingly and submit them back to the architect. The architect's model manager will provide the construction manager's model manager with the Architectural model and the Consulting Engineers' models.

3.4.6 Construction Phase

3.4.6.1 Objectives: Update Architectural and Consulting Engineers' models based on submittals, RFIs, or owner-directed changes; maintain the Construction model based on construction activities. The construction team will submit RFIs and submittals through the collaborative project management system.

3.4.6.2 Model Roles: The Architectural and Consulting Engineers' models will be revised throughout construction, based on owner directives and As Built comments. The models will always reflect the revised contract documents. The Construction model will be used for scheduling analysis, construction sequencing, and trade coordination.

3.4.6.3 Responsibilities: The architect's model manager will work with their consulting engineers to answer the RFIs and submittals and adjust the models accordingly. The construction manager's model manager will update the Construction model and will work with the architect to develop the Architectural and Consulting Engineers' models.

3.4.7 Close Out (Design Team)

3.4.7.1 Objective: Use the Architectural and Consulting Engineers' models for facility management, with the possibility of use in ongoing operations.

3.4.7.2 Model Roles: The Architectural and Consulting Engineers' models will be used to represent the actual assembly of the building from construction.

3.4.7.3 Responsibilities: The architect will deliver the models at the end of the project to the owner.

3.4.8 Close Out (Contractor)

3.4.8.1 Objective: Use the Architectural and Consulting Engineers' models for facility management, with the possibility of use in ongoing operations.

3.4.8.2 Model Roles: The Architectural and Consulting Engineers' models will be used to represent the actual assembly of the building from construction.

3.4.8.3 Responsibilities: The contractor will deliver the models at the end of the project to the owner.

3.5 Analysis Plan

By listing and specifying what types of analysis your project will likely require at the beginning of your project, you can ensure that your key models will include the relevant information, making the analysis easier and more efficient.

3.5.1 Analysis Models

Your project's scope of work may require performing certain kinds of analysis, such as the ones listed below, based on existing or specially created model(s). In most cases, the quality of the analysis depends on the quality of the original model that the analysis is derived from. Therefore, the project team member performing the analysis should clearly communicate the analysis requirements to the original model authoring team member.

3.5.1.1 Quantity Takeoff Analysis

The objective of quantity takeoff analysis is to use modeling property data to automate or simplify the quantity takeoff process. This information from the quantity takeoff tool can then be imported or tied to cost-estimating software. In order for the quantity takeoff process to work seamlessly, the original modeling author will need to include the relevant property information in the design and an agreement of modeled content communities to estimate.

3.5.1.2 Scheduling Analysis

Scheduling analysis lets the project team use the project model to analyze the timeline and sequencing for construction. This information can then be used to modify or adjust the construction schedule. Tools currently exist that allow project team members to visualize the construction over time, but no systems exist yet that interact automatically with scheduling tools.

3.5.1.3 Visualization Analysis

Visualization tools let the project team view the design or construction of the project in 3D, giving them a more accurate perspective of the product.

3.5.1.4 LEED Rating/Energy Analysis

LEED (leadership in energy and environmental design) Rating/Energy Analysis tools help the project team evaluate the impact of design decisions on sustainability and energy consumption. This analysis model is usually based on the main Architectural model, after which material and building system inputs can be used to evaluate the project's sustainability and energy consumption.

3.5.1.5 Structural Analysis

Structural analysis tools use the model to analyze the building's structural properties. Structural analysis programs typically use the finite element method (FEM) to measure the stresses on all structural elements of the design. For structural analysis to work seamlessly, the original structural modeling tool needs to be compatible with the structural analysis tool, and the original structural model property data must include information about the structural elements.

3.6 Detailed Analysis Plan

For each type of analysis that may be performed for your project, list the models used for the analysis, which company will perform the analysis, the file format required for the analysis, the estimated project phase, and the analysis tool that will be used. If there are, other special instructions associated with the analysis, mark the Special Instructions column and list the details in the Special Instructions table in the next section.

Analysis	Analysis Tool	Model	Analyzing	Project Phase	File Format
Visualization		Architectural & Structural Model			.rvt/.nwf
Structural		Structural Model			.rvt
Quantity Takeoff		All Models			.rvt
Scheduling /4D		All Models			.rvt/.nwf
Cost Analysis /5D		All Models			.rvt/.nwf
Energy/LEED		Architectural Model			.IFC/ .rvt/.gbXML
Daylight/Lighting		Architectural Model			.IFC/ .rvt/.FBX

3.7 Clash Detection Process

Clash detection analysis is done to check for interferences between the designs of one or many models. To reduce change orders during construction, clash detection should be performed early and continue throughout the design process. For clash detection to work properly your project's models, need to have a common reference point and they must be compatible with the clash detection tool.

4 Concurrent As-Built Modeling Plan

As-built modeling will be a collaborative effort between the Architect and consultants and the construction team. During the construction process, the design team will incorporate changes triggered by requests for information (RFIs), architect's supplemental instructions (ASIs) and change orders in into the Architectural and Consultant models. At specified dates during the construction process, the construction team will provide the design team with necessary changes due to shop drawings, coordination drawings and change orders. As required, the completed form of the

construction will also be verified at these specified dates using laser scanning. The design team will then incorporate the changes reported by the construction team into the Architectural and Consultant models. At the end of construction, it will be the updated Architectural and Consultant models that are used for facility management.

5 Construction Capture Schedule

Event	Date	Parties involved
Construction Capture 1		Construction team, Design Team, [Laser Scanning]
Construction Capture 2		Construction Team, Design Team, [Laser Scanning]
Construction Capture 3		Construction Team, Design Team, [Laser Scanning]
Construction Capture 4		Construction Team, Design Team, [Laser Scanning]

6 Collaboration Plan

Creating a collaboration plan early on—including defining permissions and file structures—will help team members efficiently communicate, share, and retrieve information throughout the project. It lets you get the most out of your collaborative project management system, saving time and increasing your ROI.

7 Document Management

A Collaborative Project Management system will have to be researched and agreed upon prior to start of project. The requirements of the Collaborative Project Management system are:

- Be web-based or web-enabled—so all relevant, authorized project team members can remotely access it.
- Accommodate different permissions profiles for different project team members.
- Allow communication through either internal messaging or system-generated email.
- Include document management capability that lets the project team create a customized and permission-based folder structure, which offers upload, download, and version control capabilities.
- Include a viewer that allows the project team to view .dwg, .dgn, .plt, .dwf, .pdf, .tif, .jpg, .doc, and .xls files.
- Include construction management capabilities for the tracking of requests for information (RFIs), submittals, design review, meeting minutes, daily reports, issues, correspondence, and transmittals.
- Able to interact with the file folder structure in the document management section.
- Able to automatically accept raw data from the clash detection tool.
- Include bid management capability, and this bid management solution should allow the project team to post the contract drawings and specifications for viewing in the form of a Plan Room.
- Allow for cost management controls, and this cost management capability should include budgeting, contracting, change orders processing, and payments applications tracking.
- Allow the project team to run reports based on the information in the system.

- Allow for the workflow and routing throughout the document, construction and cost management components of the solution.

8 Document Management Solution

A document management solution will be provided by the owner. The document management solution that will be used is called [TBD]. The architect will setup the site and set up all permissions for the site. The architect will lead a training session for the entire project team on how to use the site. The site will be maintained from the signing of this document until the occupation of the building.