THE ART OF PROJECT MANAGEMENT IN THE AEC INDUSTRY

By: Colleen Finkl, Project Manager

Being a project manager in the Architecture, Engineering, and Construction (AEC) industry is akin to being a ringmaster in a three-ring circus. You are the face of the project, ushering stakeholders, design team members, and deliverables seamlessly in and out of their respective rings on time, satisfying and engaging the clients in the audience, all while navigating the controlled chaos.

Of course, we have project management methodologies from the Project Management Institute's Project Management Body of Knowledge (PMBOK) and agile principles to use as the foundation for project coordination. Unfortunately, though, we do not always have the luxury of following the predictive approach's five process groups, ten knowledge areas,

and 18 Project Management Plan components "to the T." Further, most of your design team won't be well versed in PMBOK methods. Adapting and applying project management principles to AEC design projects provides the foundation for collaboration between architects, engineers, and clients. Effective communication and coordination, especially critical in today's remote and hybrid working environments, help ensure that the design vision is translated into a structurally sound and functionally built environment. Most importantly, with proper management, the design is delivered on time and within budget. Let's explore the foundational project management principles and proven techniques I use for successful project delivery.

▶▶ IMPLEMENT COMMUNICATION MANAGEMENT PLANS

A communication management plan is critical to the success of any project, especially those with numerous stakeholders. The communication management plan standardizes and documents who sends and receives information, the delivery method (via email, posted to the project's SharePoint, etc.), and the frequency of communication. On large projects, I suggest using two separate plans. One vertically oriented to the client, containing status reports and risk mitigation strategies, and another for the internal design team.

▶▶ COLLABORATE EARLY AND OFTEN

Early collaboration with the internal design team and with the client, key stakeholders, and key design team members is essential. Conducting a project kickoff meeting is a great opportunity to introduce team members, discuss project goals and requirements, define roles and responsibilities, propose the communications management plan, and create a roadmap for the project implementation process. Be sure to schedule regular design team meetings as well to review progress, discuss challenges and take a holistic look at pinch points. If your meetings are remote or hybrid, encourage participants to turn on their cameras to help build rapport but have participant camera flexibility.

The AEC industry tends to follow traditional predictive project management principles; however, infusing adaptive or agile principles to create a hybrid approach allows for more flexibility. During fast-moving portions of projects, I hold 15-minute daily standup meetings (referred to as "The Daily Scrum") with my team to outline the day's work objectives and identify any issues needing resolution. Each discipline briefly answers the same three questions: what did my discipline accomplish yesterday; what is my discipline working on today; and are there any obstacles we need assistance with? Maintaining strong and consistent collaboration methods is critical to project success and client satisfaction.

▶▶ DISCUSS, DOCUMENT, AND DISTRIBUTE PROJECT REQUIREMENTS

The term "requirements" has different meanings and interpretations germane to AEC projects, all of which should be discussed, documented, and distributed. In PMBOK, defining project requirements starts with a high-level project scope statement. The project scope should be discussed and codified with stakeholders to clearly and collaboratively define what the project's needs are and how those needs will be met.

Take caution as codes, regulations, and standards can differ based on a project's location, owner, or start date. For example, a federal government building project in the City of Chicago does not follow City of Chicago code. At project initiation, confirm code and standards requirements with the client and request client-specific documents to avoid disconnects.

Compare internal requirements, guides, and checklists against those from the client and project, as these documents are commonly unaligned. One example of these types of inconsistencies can be seen in construction projects. At the 60% Construction Documents (CDs) milestone, the client only requires receptacles and electrical equipment layouts be shown. However, your internal design guide may state receptacles and electrical equipment should be laid out and circuited. Focus on designing to the client's requirements to avoid over-engineering.
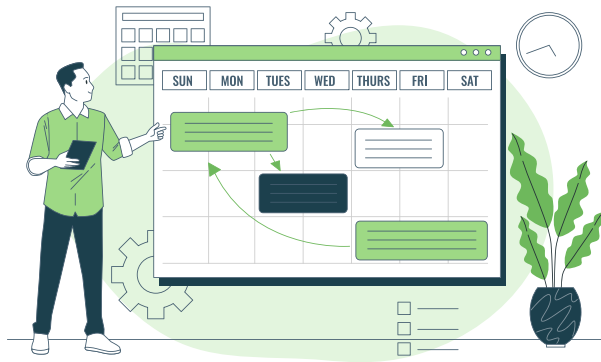
▶ UNITE DESIGN TEAM DISCIPLINES

By adopting an integrated approach, holding regular design workshops and coordination meetings, and outlining back of house requirements, we avoid the "the architect did not leave enough room for my equipment" scenario. Further, when disciplines have an integrated understanding of requirements, clashes and conflict (which create unnecessary rework) between architectural, structural, and engineering elements are reduced. If the workshops and coordination meetings are remote or hybrid, encourage participants who are comfortable having their cameras on to do so during open discussions but explain and maintain camera flexibility.

▶ LEVERAGE COLLABORATIVE DESIGN & COMMUNICATION SOFTWARE

Remote workforces, multi-consultant projects, and information security drive the need for cloud-based collaboration tools. With these tools, team members have up-to-date models and can efficiently find information. Taking advantage of collaboration tools reduces version-control errors and enhances efficiency.

Cloud-based platforms such as *BIM 360 Design* allow all disciplines working in the model to see changes and updates as they are made. Not having to regularly share models reduces rework and eliminates confusion on which model is current. The use of Working Views, which show other disciplines' work, helps engineers and architects avoid placing building systems or architectural elements in conflict with each other. Ultimately, this enhances coordination and productivity.

Bluebeam Revu enables collaborative markup and annotation of PDF drawings, facilitating communication between disciplines. Drawing comments can be responded to and closed out within *Revu*, and exported creating a checklist of items that need to be updated in the model. *Revu* sessions can also be incorporated into a project's Quality Assurance/Quality Control (QA/QC) procedures for multi-disciplinary and single discipline QA/QC. Within Primera's Buildings team, we have incorporated *Revu* sessions into our ISO-certified Quality Management Systems (QMS) procedures for internal and client design reviews and verification.

Conflicts between different building systems or elements (e.g., duct work, piping, conduit, structural beams, door swings) are bound to happen during design, especially on fast-moving or complex projects. Using a tool like *Navisworks* to identify and resolve clashes throughout the design process helps prevent costly rework during construction.

Using a cloud-based common data environment (CDE) to store, share, and coordinate project information, especially if your design team has outside consultants, simplifies information exchange. CDE options range from basic such as *SharePoint* to the AEC-specific *Autodesk Construction Cloud*. Standardize the file structure and naming conventions and implement revision control for ease of locating current project information.

AEC SOFTWARE ROUNDUP

BIM 360 Design
Strengths: Cloud-based, multi disciplinary, live changes and updates to model.

Bluebeam Revu
Strengths: Collaborative markup and annotation capabilities that can be used in QC/QA process.

Navisworks
Strengths: Identify and resolve conflicts between discipline teams.

SharePoint
Strengths: Information hub that can be shared with external consultants and team members.

Autodesk Construction Cloud
Strengths: Information hub that is AEC-specific.

▶ BE PREPARED FOR CHANGES

Explain project change control procedures during the project kickoff meeting. Maintain a change log and review it against the project scope and contract documents regularly. Change logs should include a description of the change, date requested, reason, and cost and time impacts. If the client requests changes outside of the contract scope, document the request, add it to the change log, and refer to the change control procedures agreed upon during the kickoff meeting. The best time to ask for a change order or additional fee is as soon as possible! The design team needs to know if the change should be implemented.

Prior to issuing progress drawings and specifications, set a date to freeze the model. After this date no more significant changes (e.g., door relocations, floorplan changes) are made, avoiding chaos and panic down the road. The freeze date is what I call "the end of the good ideas."

▶▶ TIMING IS EVERYTHING

Utilize a work breakdown structure and factor in "finish-to-start" activities. I refer to this technique as the "Discipline Waterfall." As an example, the architect needs to confirm building envelope information so mechanical can size and select equipment. Electrical needs mechanical's equipment selections and power information. Use the Discipline Waterfall and the time needed to integrate the information into design to set internal deadlines and meet project milestones.

Unattainable timelines requested by the client are common, often because the client is not familiar with the required level of effort. While not successful all the time, I have found that providing a high-level explanation of the work required coupled with requesting an adequate timeframe can help keep the project running at a pace the design team and client are comfortable with.

✔ FOSTER SUCCESS

As project managers, our multifaceted ringmaster role involves orchestrating collaboration, ensuring effective communication, and adapting to change. While plans and methodologies provide structure, our agility and timing drive successful outcomes, even for the most complex projects. By utilizing foundational project management principles in conjunction with AEC industry best practices, project managers can foster a collaborative environment to efficiently and successfully deliver design projects while meeting stakeholder expectations.

ABOUT THE AUTHOR

Colleen Finkl is one of Primera's premiere program and project managers for our consulting and buildings teams. Her expertise is the result of over 20 years of project management experience in local, federal, and private sector environments, with cumulative project responsibilities totaling over $2.5 billion.