AIA

THE ARCHITECT'S HANDBOOK OF PROFESSIONAL PRACTICE

9.2 Managing Architectural Projects

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When the delivery of services for architectural projects is well managed, those projects are more likely to meet their goals and objectives and fulfill the expectations of their owners.

The design and construction industry is a project-based world. As such, project management is a key component for any architect or architecture firm. Effective project management requires an understanding of project management basics, which are equally applicable to any project, from the development of a large hospital to the design of a one-room addition to a house. Knowing how and when to apply appropriate tools and techniques will make management activities easier, more efficient, and more professional.

Except on the smallest of assignments and in smaller offices, the project manager does not personally produce the major project deliverables. Rather, the project manager must know *who* can produce the required services, *when* those services must be carried out, and *how* those services fit into the overall project delivery scheme. In short, while project managers will do some of the work, their primary role is to direct the work being done by others. In fulfilling this role, the project manager delegates responsibilities to those with the design and technical expertise needed to complete the required work.

► This topic covers the process of project management for architectural projects. The Effective Project Manager (9.1) addresses the desirable personal attributes and qualities of project managers.

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Project management activities for architectural projects can be clustered in the following groups:

- Planning, organizing, and staffing the project
- Facilitating the work
- Monitoring progress
- Concluding the project

These groups of activities essentially embody the full range of tasks and responsibilities that project managers will encounter in their assignments. The remainder of this topic—organized according to these groups—provides specific guidance and identifies practical methods, tools, and techniques that can be used to carry them out.

Project managers should be actively involved in the development of proposals and agreements. Both small and large offices require a certain discipline when developing these documents, since they set forth the foundation for project success or failure. Ideally, the project manager will be included in both the initial preparation of proposals and agreements as well as in the negotiation of final agreements. Participating in this process will give the project manager an intimate knowledge of both the firm's and the client's goals, and his or her familiarity with the issues will help the firm maintain continuity throughout the delivery process. Encouraging involvement of the project manager during this crucial stage of relationship building with the client also demonstrates the firm's confidence in the leadership and authority of the project manager.

PLANNING, ORGANIZING, AND STAFFING

The project manager usually takes charge of planning, organizing, and staffing a project. This simply means the project manager develops a primary understanding of how and when the project will be worked on and what leadership and staff will be needed to perform the work. The project manager usually interacts with firm leaders, and perhaps with other project managers, as this understanding becomes documented in a work plan.

Development of a work plan for the project begins with consideration of schedules, ways to organize relationships between the parties, the firm's available resources, and perhaps fees. In addition, how the leadership for the project will be organized and what experience and specialty levels will be required are identified.

The Work Plan

The work plan is a key part of effective project management. To be useful, a work plan need not be complicated or lengthy. For most projects, it need only include the elements listed below. Even on large projects, this information may take up no more than a few pages.

1. Project description and client requirements
2. Statement of deliverables
3. Team organization chart
4. Responsibility matrix
5. Preliminary project schedule
6. Preliminary staffing needs
7. Project directory
8. Internal project budget and profit plan
9. Code information (optional)

Maintaining a work plan is an ongoing process. Projections for staffing, schedules, and budgets must be revisited and adjusted as new information becomes available. When carefully prepared, Items 1 through 7 can be presented to clients to illustrate how you plan to approach their projects.

Project description and client requirements. The work plan includes a description of the project, including its scope and the client's budget, as well as a record of what work the client has authorized. The client's primary goals for the scope and quality of the project should also be incorporated into the project description. A project description would read something like this example:

A 300-room four-star luxury hotel, located on the waterfront at 212 Boardwalk Street in Any City, including two restaurants, conference facilities for 500 guests, a full-service spa, a resort-quality swimming pool, and landscaped grounds.

This example demonstrates how the project description can be communicated in a short statement, which can later be expanded in greater detail as the program for the project is developed.

Depending on the project phase, client authorizations may be represented in the work plan by a simple checklist of authorized work keyed to copies of signed owner-architect agreements. Client authorizations can include various kinds of documentation, ranging from letters of agreement to formal contracts to phase-completion sign-offs. The project manager tracks and monitors all of these authorizations.

Statement of deliverables. Projects normally include a work product or deliverable produced by the architect. Such deliverables may include reports, sketches and drawings, specifications, virtual or physical models, and other items. The work plan should include estimates for the types and quantities of deliverables required to complete the work. The format of this estimate can be a simple list or a storyboard or cartoon depiction of the deliverables for each phase of the architect's services. This description and estimate provide a basis for developing the project schedule, staffing needs, and budget for the architect's work.

Team organization. More and more, owners want information on how the architect will organize project staff, and how that staff will relate to other parties involved in the project. A chart is helpful for communicating the relationships between the project team participants.

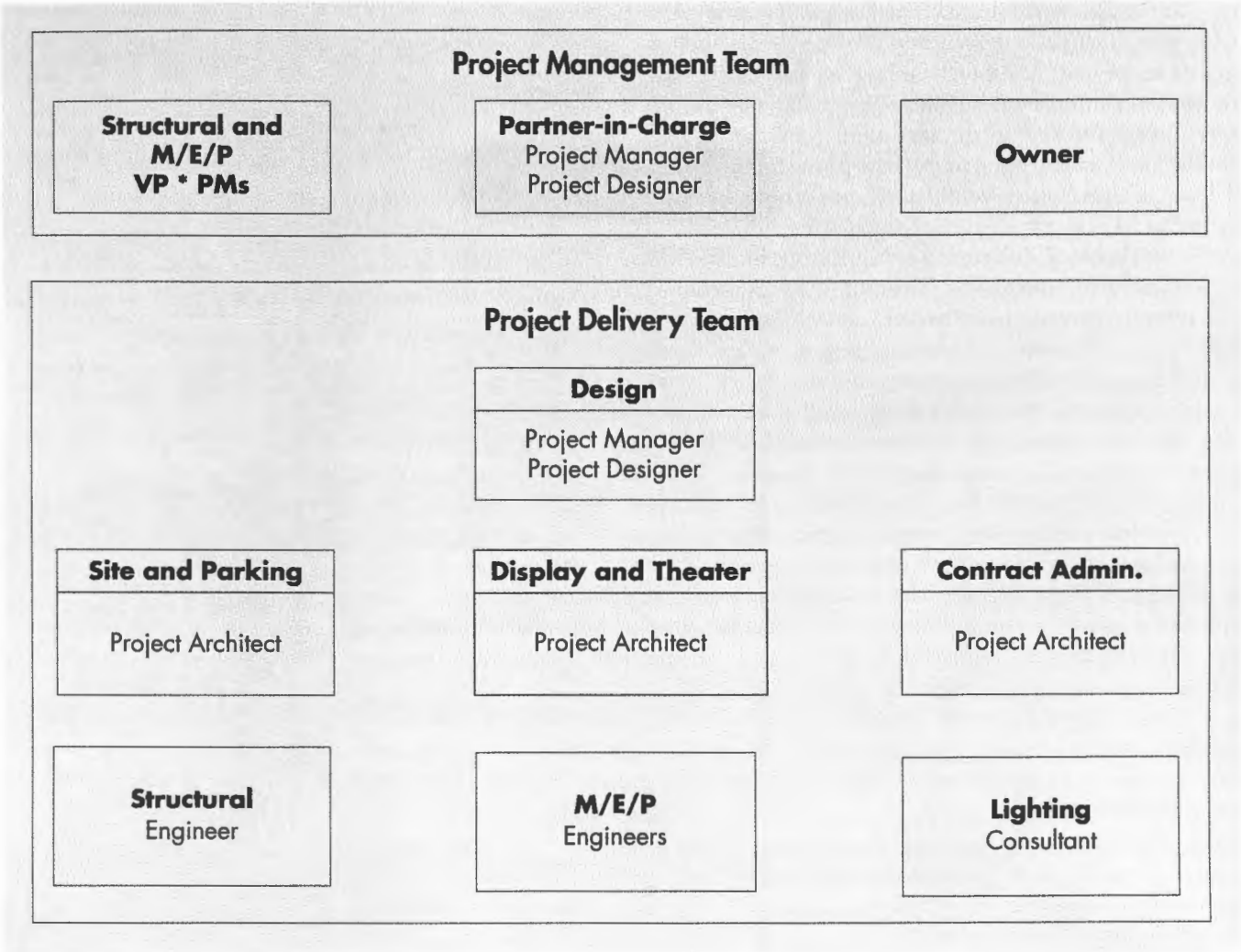
A team chart typically reflects who the primary project leaders will be, such as the principal-in-charge, the project manager, designers, project architects, and job captains. While there can be many position titles in an architect's office, the basic intent of the team chart is to define the hierarchy of the architect's team, reflect who will be responsible for what assignments, and show primary relationships between members of the project team.

Usually, there will be one or more project leaders, regardless of project size. For a large project, several project leaders may appear on the project management team. For a small firm and a small project, the architect's project team chart may include only the firm principal.

Responsibility matrix. A companion task to defining deliverables is determining who will do what on the project. When a project requires consultants, it is important to have an explicit understanding of what each consultant will do. For example, it is not enough to have a seat-of-the-pants understanding that the M/E/P engineer will "do the M/E/P engineering." A more detailed understanding would distinguish responsibilities such as these: "The electrical engineer will wire and circuit the landscape architect's lighting design" or "The M/E/P engineer will coordinate HVAC equipment selections with the acoustical engineer." The following sidebar illustrates a responsibility matrix, which is a convenient way to communicate project assignments.

"PROJECT AT A GLANCE" WORK PLAN

Some firms formalize the work plan and require that it be maintained throughout the life of the project. At one firm, the work plan is called a "Red File." It includes information that would reasonably be required to give anyone assigned to the project a quick summary of what is going on. In addition to basic project information, the Red File includes a current accounting status printout, an electronic copy of the most current drawings in PDFs, and copies of the owner-architect and owner-contractor agreements and general conditions, if they are available. The file, assembled in a red jacket, is maintained at the project manager's desk and is available for viewing by company leaders or interested employees.



Sample Project Organization Chart (History Museum). The project management team fulfills the need for careful collaboration between managers, designers, consultants, and the owner to effectively address the numerous management decisions associated with a project. Depending on project size, there may be more than one designer, project manager, or project architect on the project delivery team. For smaller projects, these may be the same person wearing different hats.

Preliminary schedule. Most requests for proposals (RFPs) received or tendered by the architect relate in some manner to the project schedule. This means the work plan should delineate the preliminary project schedule as clearly and as accurately as possible. Whether the objective is to complete a retail project in time for the fall shopping season or to open a sports facility for the opening home game, the owner's goals for the project often dictate its major milestones. Into this mix, the architect must project the team's ability to perform the work within the owner's set of key dates. The preliminary schedule is one of the primary drivers of the architect's assessment of staffing needs.

Preliminary staffing needs. Preliminary staffing requirements can be estimated once the project scope has been delineated, the deliverables understood, the consultant's responsibilities defined, and a preliminary schedule developed. The project manager may work with upper management (in a larger firm) to determine what key personnel will be available and what support staff will be required. If available staffing becomes a

SAMPLE PROJECT RESPONSIBILITY MATRIX

	Corporate Office Building	A	TA	S	M/E/P	C	L	SC
1	Site landscape					X	X	
2	Site grading and drainage					X	X	
3	On-grade parking	X		X	X	X	X	
4	Parking structure	X		X	X			
5	Optimize lease depth and floor plate	X	X					
6	Special tenant floor loading requirements			X				
7	Exterior structural plazas			X		X	X	
8	Structural engineering: Core and shell			X				
9	Structural engineering: Tenant specialties			X				
10	Fire exit stairs	X						
11	Stairs: Lobby monumental stair	X	X					
12	Stairs: Special tenant stairs		X	X				
13	Exterior envelope, roofing, and details	X		X				
14	Doors and hardware: Exterior entry doors	X						
15	Doors and hardware: Interior areas		X					
16	Interior: Main lobby, core areas, and toilets	X	X		X			
17	Interior: Tenant areas		X		X			
18	Drywall interior side of exterior wall	X						
19	Interior window treatments		X					
20	Graphics		X					X
21	Cafeteria and kitchen	X	X		X			X
22	Elevator service	X						X
23	HVAC: Equipment/risers	X			X			
24	HVAC: Fixtures and trim		X		X			
25	HVAC: Tenant distribution		X		X			
26	Plumbing: Service and risers	X			X			
27	Plumbing: Fixtures and trim	X			X			
28	Plumbing: Tenant		X		X			
29	Electrical transformers	X			X			
30	Electrical service and risers	X			X	X	X	
31	Emergency generator	X	X		X			
32	Lighting: Exterior and landscape	X			X	X	X	X
33	Voice, PA, and data systems		X		X			X
34	Security systems		X		X			X

Legend	
A	Architect
TA	Tenant architect
S	Structural engineer
M/E/P	M/E/P engineer
C	Civil engineer
L	Landscape architect
SC	Special consultant

greater constraint on the firm's ability to deliver the project than the client's scheduling goals, the firm may need to revisit the preliminary schedule with the client and perhaps revise it.

Project directory. A project directory with current listings for all project entities and their key personnel should be included in the work plan. This can be prepared in a format the firm normally uses, or the entries can be printed from an e-mail management

► Project Controls (9.3) provides information about managing project budgets.

program such as Microsoft Outlook. More simply, organized copies of business cards can be used to develop a directory.

Project budget and profit plan. The project manager may sometimes be assigned the duty of apportioning the project fee to the various tasks required to produce the work to help estimate and plan for the firm's profit. Often referred to as a job cost budget or a project budget, a copy of this should be included in the work plan.

► Building Codes and Standards (10.2) presents the concepts and basic elements of building codes.

Regulatory requirements. Information about the primary building code(s) and local amendments that will apply to the project can be a very useful part of the work plan. This information could range from a simple list of the applicable codes and ordinances to a full building code report prepared by the architect. Including this information gives the project team a close-at-hand opportunity to get an answer to the frequent question, "What code are we using?"

Negotiating and Developing Project Schedules

► See the backgrounder Project Scheduling in Project Controls (9.3) for examples and discussions of different schedules and scheduling software.

The greatest prerequisite to negotiating and managing a project schedule is an understanding of what a project schedule is. While many believe a schedule is a list of time periods and deadlines, in reality, it is a series of interrelated commitments agreed upon by all project participants. The owner relies upon the architect and the contractor to understand their duties, obligations, and assignments well enough to predict their performance within a given time frame. The architect and contractor rely upon the owner to understand what actions and decisions will be required to maintain an orderly process for the design and construction phases.

Owners contemplating a project often have definite scheduling goals, and architects often find it difficult to push too hard for a fair and balanced design schedule that conflicts with the owner's goals. Consequently, architects often agree to an owner's schedule on the assumption they can do whatever it takes to complete the project. A more effective approach is to develop a work plan and carefully balance task objectives against available staffing over the project timeline. It is far better to discuss staffing and schedule conflicts before the project begins—or early in the project—than to discuss it after a conflict creates the perception the architect failed to achieve key schedule milestones.

Architectural services take time to provide, and the project schedule should allow adequate time. Negotiating a reasonable schedule that considers how long it will take to perform the work with the architect's available staff is a key precursor to a successful project.

SCHEDULING TIPS

Project tasks, which are a set of interrelated project events, should be scheduled to reflect how they are likely to occur. For example, if the M/E/P engineer will require two weeks to coordinate with the structural designs, the schedule should reflect this fact rather than the normally desired alternative that all consultants finish at the same time. Likewise, realistic approval periods for reviews by the authority having jurisdiction (AHJ) should be recognized, even when the time periods seem protracted.

Along similar lines, it is routine to ask the architect and consultants to make changes to the project documentation as selected major suppliers and subcontractors begin to suggest design alternatives and substitutions. Such suggestions are often beneficial but can be disruptive. If time is allowed in the schedule for contractor-initiated document revisions, all parties can anticipate the time that will be required to incorporate those revisions. Time for this activity should also be reflected in the contractor's work plan, since suggested revisions are most commonly generated by the contractor and subcontractors.

A project schedule helps set owner and contractor expectations. When realistic commitments are delineated in the schedule, there are likely to be fewer surprises.

Project Staffing

When project leaders and staff positions have been identified, the project manager reviews the project organization chart and the required tasks to verify that assigned staff have the needed skills and experience for the work they will be doing. In fact, staff experience is rarely evenly matched to the project assignments, so the project manager will always need to make adjustments to effectively use the talents of everyone assigned to a project.

Project managers often face the conundrum of balancing the staff needed to do the work against the project staff the fee can sustain. In this situation, the vulnerability faced by both the firm and the project manager is the temptation to sacrifice quality for profit. The firm principals

SAMPLE STAFF SCHEDULE

Proj. No.	Project Name	Phase	Staff	Position	1-Mar	8-Mar	15-Mar	22-Mar	29-Mar	5-Apr	12-Apr
07002	Grandview Condominiums	SD	Anderson	Principal			10	10	10	10	10
07002	Grandview Condominiums	SD	Lombard	Proj Mgr			40	40	40	40	40
07002	Grandview Condominiums	SD	Little	Designer			30	30	30	30	30
07002	Grandview Condominiums	SD	Hill	Arch I						20	40
07002	Grandview Condominiums	SD	Ramos	Arch I					20	40	40
06005	Green Acres CC	DD	Anderson	Principal	10	10	10	10	10	10	10
06005	Green Acres CC	DD	Jordan	Proj Mgr	40	40	40	40	40	40	40
06005	Green Acres CC	DD	Little	Designer	40	40	10	10	10	10	10
06005	Green Acres CC	DD	Garcia	Arch II	40	40	40	40	40	40	40
06005	Green Acres CC	DD	Blanton	Arch I	40	40	40	40	40	40	40
06005	Green Acres CC	DD	Garzoli	Arch I	40	40	40	40	40	40	40
06005	Green Acres CC	DD	Middleton	Arch I	40	40	40	40	40	40	40
06005	Green Acres CC	DD	Li	Intern	20	20	20	20	20	20	20
07001	Midtown Office Complex	SD	Johnson	Principal	10	10	10	10	10	10	10
07001	Midtown Office Complex	SD	Jones	Proj Mgr	30	30	30	30			
07001	Midtown Office Complex	SD	Hickerson	Designer	30	30	30	30	30	30	30
07001	Midtown Office Complex	SD	Kim	Arch II	10	10	20	20			
07001	Midtown Office Complex	SD	Halverson	Arch I	40	40	40	40			
07001	Midtown Office Complex	SD	Jones	Proj Mgr					20	20	40
07001	Midtown Office Complex	DD	Kim	Arch II					20	20	20
07001	Midtown Office Complex	DD	Halverson	Arch I					40	40	40
07001	Midtown Office Complex	DD	Cohen	Arch I					20	20	20
06003	Smith Residence	CA	Anderson	Principal	10	4	4	4	4	4	
06003	Smith Residence	CA	Jones	Proj Mgr	10	10	10	10	20	20	
06001	Valleyview Middle School	CD	Johnson	Principal	20	10	10	10	10	10	10
06001	Valleyview Middle School	CD	Hull	Proj Mgr	40	40	40	40	40	40	40
06001	Valleyview Middle School	CD	Hickerson	Designer	10	10	10	10	10	10	10
06001	Valleyview Middle School	CD	Murphy	Arch I	40	40	40	40	40	40	40
06001	Valleyview Middle School	CD	Kim	Arch II	30	30	20	20	20	20	20
06001	Valleyview Middle School	CD	Minkus	Arch I	40	40	40	40	40	40	40
06001	Valleyview Middle School	CD	Berger	Arch I	40	40	40	40	40	40	40
06001	Valleyview Middle School	CD	Cohen	Arch I	40	40	40	40	20	20	20

This is a sample staff-scheduling chart for a twenty- to twenty-five-person firm showing staff assignments on projects over a seven-week period.

should debate this philosophical question and reach a stance that can be incorporated into the firm's culture so this burden is taken away from the project manager. The project manager must be allowed to focus on the quality of services provided to the client.

FACILITATING THE PROJECT

As the role of the project manager has evolved, what was once thought of as "controlling" the project has come to be more a role of "facilitating" the project. The delivery of design services is facilitated through communicating effectively; developing good working relationships with the client, contractor, and consultants; providing assistance to parties whose decisions are necessary to keep the design services moving forward; and developing and using effective documentation.

Managing the Project Team

Managing the project team? This sounds like an overwhelming responsibility. However, the basic requirement boils down to a few key ideals. The first calls for understanding what the team is to accomplish. The second requires an understanding of who on the team has the skills to do what tasks, and where additional resources may be needed. The third is fostering a communications environment in which all parties are kept informed of what is expected of them and when their assignments are due. The key tools and techniques for accomplishing this are the work plan, effective management of project meetings, and reasonably thorough documentation of key project decisions and actions.

Client Relationships

The project manager's relationship with the client is key to both understanding the client's goals and to communicating with the client. This relationship must be close enough that the project manager can gain a comfortable understanding of the client's expectations. If the client's expectations do not align with the architect's intended services, then either the architect's services must change or the client's expectations must change. Having confidence in each other's abilities and integrity will facilitate resolution when conflicts occur. Candor and honesty are always beneficial for developing a relationship in which news and events can be presented with a neutral, unemotional attitude.

Decision Making

It is commonly understood that there are few occasions when the architect makes a decision. Instead, the architect typically gives a *recommendation* upon which the client may base a decision. For example, the architect makes decisions about substantial completion and final completion, but commonly these decisions are heavily infused with input from the owner and the contractor. In a dispute, the architect—seeking faithful performance by the owner and the contractor—renders a decision about conditions that can reasonably be inferred from the construction documents. The full range of the authority and decision-making responsibilities of the architect are generally delineated in the owner-architect agreements and in the general conditions of the contract for construction.

The architect does not decide on changes in scope, quality, or time except in specifically contracted circumstances. However, although the project manager cannot make decisions for the client, he or she can facilitate needed decisions by providing support and explanations to the client. For example, the project manager may prepare an executive summary of the pros and cons that the client might consider in making a decision. Or the project manager might research alternative materials and costs that reflect the options the client can choose from. Such support from the architect makes the client's work easier, and will inevitably also make the architect's work easier. (The importance of carefully documenting the client's decisions is covered later in this topic.)

Managing Project Meetings

Successful project managers must learn to orchestrate and administrate project meetings. All project managers have faced the frustration of disruptions, lack of preparation on someone's part, or disruptive—even angry—people while trying to run a meeting. It is possible to take an analytical view of managing meetings and look at some ways a project manager can be more effective. A first step is to understand the obstacles to a successful meeting, which include the following:

- Too many people in attendance
- A disruptive participant
- People who don't pay attention
- Unprepared attendees

- Sidebar conversations
- Cell phone or PDA interruptions

You will have to find a way around such obstacles, even if it means bringing a gavel to the meeting. You don't want the meeting so out of control that you have to raise your voice to get attendees to pay attention.

Meetings schedule. Arguably, for any project—but particularly for projects with more than three or four participants—it is important to hold regular meetings. Setting a routine by conducting the meetings on the same day of the week at the same time is advisable. Personal schedules tend to fall into a groove, and the participants will adapt more effectively to regularly set meetings. On smaller projects, it will save time and expense to organize the meeting via conference call if the agenda is short. Remember, it is important not to skip meetings. Missed meetings erode communication, and lack of communication is at the root of most problems on architecture projects.

Meeting management plan. The primary purpose of a meeting management plan is to ensure people attend the meeting when their input is required and stay away when it is not. Decisions cannot be made or obtained without the necessary participants. Conversely, you cannot facilitate decision making as effectively when non–decision makers are debating the issues.

Most projects involve a hierarchy within the client organization, design team, and contractor and subcontractor team. Not every project participant needs to attend every project discussion. Whether the project is large or small, discussions run more smoothly

MEETING MANAGEMENT PLAN

Type	Purpose	Attendees from Firm	Recorded by
Executive Session			
Participants: Principals Owner Contractor/CM A/E team	Executive-level representation Decision making	Principal-in-charge Project manager	Project manager
Design Review Session			
Participants: Owner Contractor/CM A/E team	Design direction Design review and approvals	Principal-in-charge Project manager Project architect	Project manager
Project Meeting			
Participants: Owner Contractor/CM A/E team Special consultants	Project planning and general decision making	Principal-in-charge Project manager Project architect	Project manager and project architect
Coordination Meeting			
Participants: Project architects Project engineers Optional: Contractor/CM Owner	Coordination Work session	Project architect Job captain	Project architect
Redline Work Sessions			
Participants: Project architect Job captains Consultants' staff	Coordination Work sessions	Project architect Job captain	Job captain

and time is used more efficiently when meetings are divided into executive sessions, project design meetings, general project meetings, coordination sessions, and redline work sessions. The accompanying chart illustrates a meeting management plan type that can be shared with all parties.

Executive sessions. Critical and formative decisions are made at the highest levels in an owner's organization. Whether the client is a large corporation or a couple desiring a new home, there will be key meetings during which important decisions are made. These meetings are most effective when as few attendees as possible are in the room. Meet with the owner and other key project leaders early on, and develop an understanding of who will make critical decisions about aesthetics, scope, cost, and schedule. Schedule executive sessions separately from other meetings, and invite only key decision makers.

Project design meetings. When design aesthetics are presented and discussed, it may not be necessary to have all the technical leaders present. For example, when lobby floor paving patterns are discussed, input from the mechanical or electrical engineer may not be needed. A generally successful approach is to make design presentations and solicit owner concurrence with the design direction early in a meeting—before most other participants arrive for a general project meeting, or even on a separate day. Owners tend to become more engaged in design issues without the distraction of unnecessary attendees. On smaller projects, owners are more engaged when design issues are kept separate from technical issues.

General project meetings. These are meetings when approved design direction, scope, cost, and schedule are presented and discussed with most or all of the project team members. The agenda should be carefully prepared to keep the meeting as short as possible while accomplishing the purpose of keeping everyone informed. Because general project meetings tend to involve larger groups, it can be difficult to solve detailed or worrisome issues during the meeting. The best use of everyone's time is to designate attendees who will be responsible for resolving and presenting the details of such issues. The discussions required to resolve these details can take place in coordination sessions.

Meetings with authorities having jurisdiction (AHJs) such as zoning or code officials may be considered to be coordination sessions.

Coordination sessions. Also commonly called consultant work sessions, these meetings are the time to discuss and resolve issues related to building systems and other detailed aspects of the project. For example, the architect and M/E/P engineers could discuss clearances required for lights, sprinklers, and ductwork located in the plenum above the ceiling in an office building. The architect and structural engineers would discuss establishing dimension control for the structural column grid. Depending on their tolerance for long, detailed discussions, owners may or may not choose to attend such meetings. If the client does decide to attend, the project manager must take care that discussion of details is not postponed due to the client's lack of interest or patience.

Redline work sessions. These are the most detailed of all project meetings. In them, basic details for arranging and coordinating the building elements are discussed. For example, the architect and structural engineer might coordinate slab edge and brick ledges, or the architect and lighting consultant might coordinate fixture types and locations. These meetings are most successful when the topic is narrowly focused and the number of attendees is minimized. Often the only agenda items are the drawings and specifications.

The meetings described above encompass most activities that must be managed during the design and documentation phases of most building projects. On larger projects, some of these meetings may actually involve separate groups, and some meetings may be held at separate times. On smaller projects, all of the meeting categories may simply be divisions of the meeting agenda for one meeting. Persons attending and documenting these meetings are assigned and requested to attend based on what the project manager expects to accomplish.

Effective Agendas

Project managers commonly arrive at a meeting with a single sheet of paper titled an agenda. This approach reflects a misunderstanding of what is to be accomplished by

using an agenda. The actual purpose of an agenda is to facilitate discussion rather than to remind attendees of what is to be discussed. Therefore, in addition to the typical list of discussion topics, the agenda should be attached to additional pertinent information, such as e-mails, memoranda, schedules, budgets, reports, and the like. While this consumes more paper, attaching pertinent backup information to the agenda removes the risk that an important discussion item will be tabled because a particular attendee cannot recall the details to be discussed.

It is also important to gauge the amount of time to be allocated to each agenda item. To effectively moderate the meeting, the project manager should encourage making a decision and moving on to the next topic after an appropriate amount of discussion. Just as important, however, is the ability to recognize when additional discussion is healthy and to allow the dialogue between attendees to continue without interruption.

The list of agenda topics should be distributed a day or two in advance of the meeting, along with a request for comments. Although some recipients won't bother to read them, at least everyone will have an opportunity to influence the structure of the meeting.

An effective project management tactic is to include an item that may be a sticky issue on the advance copy of the agenda to get attention, even though the item may not appear on the final agenda.

Reporting on Project Meetings

Meeting reports, sometimes called minutes, are a record of the general discussion, decisions made, directions given, and assignments accepted during the course of a project meeting. With time-driven assignments, it is advisable to publish meeting reports as soon as possible after the meeting. A copy of the agenda and any meaningful handouts presented during the meeting, along with copies of drawings or sketches, should be attached to the meeting report. With the advent of digital files and sheet-fed scanners, the entire information package can be distributed quickly and inexpensively via e-mail. Meeting reports may be prepared by the project manager or a team leader appointed by the manager. The primary reporter for each type of meeting should be designated in the meeting management plan.

Although some managers believe meeting reports are primarily prepared for risk management purposes, the effective project manager understands the primary purpose of minutes is to facilitate communication among project participants. Meeting reports should be distributed to all pertinent persons—whether in attendance or not—so they can stay up-to-date on the project status, recent decisions, and what is expected from members of the project team.

Reports should record discussions in enough detail so that decisions and directions given—even if not expressed verbatim—can be reconstructed. The two most popular styles of meeting reports are the narrative report and the action-item report.

- *Narrative meeting report.* During the design and construction documentation phases, issues tend to be a little fuzzier than during the construction phase. While the need for prompt and accurate decision making is not diminished during these phases, the narrative style tends to be less intimidating to clients and thus can actually encourage them to make more timely decisions. Functioning as more of a "history," the narrative meeting report accommodates detailed explanations of issues that may not require follow-up action.
- *Action-item meeting report.* This format consists of a list of items or issues designated with a unique, nonrepetitive number. It is helpful to key each action item to the particular meeting where the issue was raised. For example: Item 21.01 represents the first new report item for meeting 21. The item is assigned to a firm or individual and is not removed from the report until it has been fully addressed or resolved. Each item should be given a due date. This provides a constant reminder to encourage resolution of the action item in a timely fashion.

It does not matter if meeting reports are handwritten or typed, although many architects prefer the formality of the latter. It also does not matter what style of report

Effective managers develop personal documentation habits that become part of their daily work. Documenting key aspects of a project is not drudgery to them because it is essential to the way they manage. Writing a meeting report, making handwritten notes, or sending a client a contract proposal becomes second nature.

From concise contracts that define the obligations of the parties involved in a project to meeting agendas and meeting notes that facilitate effective project meetings, good documentation is the essential fabric of effective project management.

is used. For example, some managers may use a simple list of bullet points to record the meeting discussions. What does matter is that the project manager communicates the discussions to everyone involved as he or she understood them, and that the directions and decisions are recorded as he or she heard them. Sharing this information gives all participants the opportunity to clarify any objections to how any item was perceived and recorded. Sharing the report also gives everyone the information they need to coordinate their efforts.

THE IMPORTANCE OF GENERAL PROJECT DOCUMENTATION

Careful documentation of milestone events and decisions—in some orderly form—is necessary for successful project management. Managers who do not retain at least a brief history of "who told what to whom" and "who decided what when" assume the risk of being unable to prove that such events occurred, a validation that could be critical for resolving any disputes that arise.

Good documentation is more than a defensive procedure to protect the architect in a dispute, however. It provides the basis for effective communication between team members and keeps all parties informed about what has taken place in the past, what is currently taking place, and expectations for what will take place in the future.

Basic Correspondence Rules

There is no industry manual for architects to follow in developing procedures for correspondence and other basic documentation. However, there are some basic principles to follow. For example, all correspondence—e-mail, letters, memos, and transmittals, as well as drawings and sketches—should bear a date and identify the project. Correspondence that cannot be connected to a specific project or cannot be placed in time in all likelihood will be virtually useless.

Memoranda. A memorandum is best used to provide an understanding of the detail of an assignment that has been accepted by a team member. Used in conjunction with a more abbreviated description that might appear in a meeting report, the memorandum provides the necessary level of detail about assignments that team members need to proceed toward delivering the project in the same orderly direction. In today's workplace, e-mail can often serve the purpose of a memorandum. If an e-mail is the preferred platform for sending a memorandum, care must be taken to include the project identifier (name or number); the date will come as a by-product of the medium.

Action items lists. The action items list is used to track the issues recorded in the meeting minutes and memoranda. If an action item-style meeting report is being used, creation of a separate list may be unnecessary, although some clients like the "issues at a glance" convenience afforded by an action items list, which consists of items or issues with brief descriptions given a unique, nonrepetitive number. The list itself might be numbered, or it might be sufficiently tracked by date. It is helpful to key each item to the meeting, memorandum, or other event where the issue was raised. Items may be assigned to a firm or an individual, and they are not removed from the list until they have been resolved.

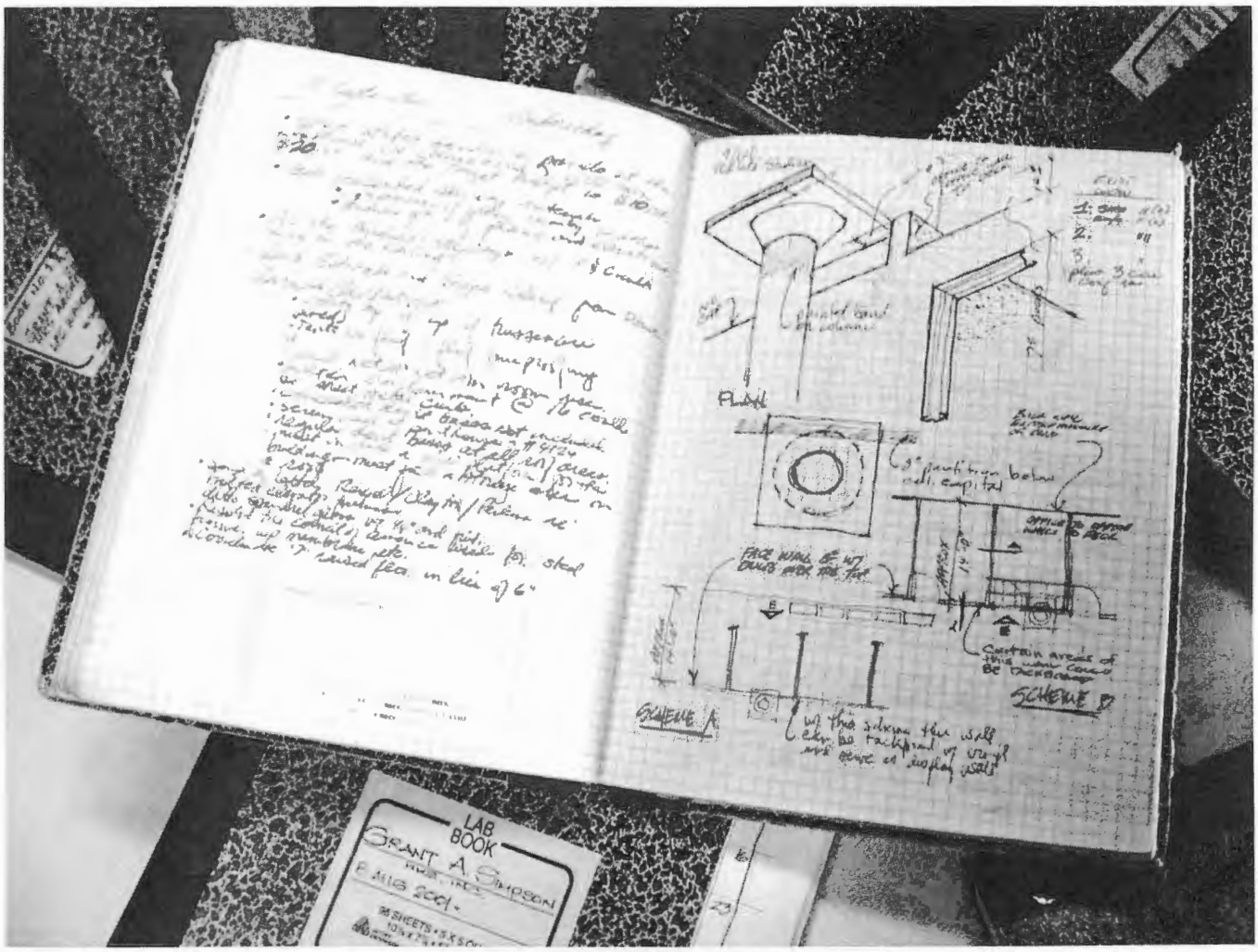
Documenting conversations. Conversations occur during meetings when others are present. Conversations also occur over the telephone or during chance encounters or in personal meetings. It is probably not necessary for a project manager to keep a record of every conversation that occurs during a project; however, it is necessary to document conversations that can meaningfully affect the project. It is important to keep a record of who generated decisions and direction, as well as when and where these actions were taken.

Important conversations that occur outside of regularly scheduled project meetings can be recorded in several ways. Some firms use a communication record or a telephone memorandum to document them. Whether typed or handwritten, a copy of these documents can be given to the person with whom the conversation took place,

as well as to the entire project team, when appropriate. A decision to approve the schematic design submittal or to extend the construction documents schedule might be copied to the entire team, while the record of negotiating the client's approval of an additional service request might be copied only to the client.

E-mail. As a business tool, e-mail is becoming more effective every day. The positive side of e-mail is that it is fast. It does not require direct interaction with a person and can be prepared at any time, without regard to a set schedule. But e-mail also has a negative side. The effective project manager must be aware that the more e-mail he or she sends, the less face-to-face personal communication is undertaken. Everyone has received a seemingly rude e-mail, only to discover after further messages or phone calls that the rudeness was unintentional. Moreover, e-mail can more easily be misunderstood than a phone call or a personal conversation. For this reason, when potentially tense or complex topics requiring in-depth discussion arise, project managers should step away from the keyboard and reach for the telephone.

Personal journal. A valuable tool for the project manager is a personal journal. Kept with the manager at all times, a personal journal provides an excellent opportunity to integrate contemporaneous documentation into the daily routine. Meetings, conversations and casual notes, sketches and business artifacts, such as business cards, can all be recorded or placed in the journal. As project participants become accustomed to seeing the manager with the journal, they will begin to reference it as the project record. The manager will also become dependent on the journal as the key reference



Sample Personal Journal

source for decisions made and direction given and other project experiences. In undertaking to keep a journal of this sort, the project manager must decide whether to keep only one journal for all ongoing projects or to keep a separate journal for each project.

Managing Information

Managing and directing the flow of project information and saving that information in an orderly manner is perhaps the most important responsibility of the project manager. Of course, not all project information is created internally. As information is received from outside sources, such as the owner, consultants, or contractors, it must be processed. Processing includes noting the date the material is received, determining who requires copies, and deciding how the information will be preserved and filed.

Distribution of information. Good project management includes making day-to-day decisions about who on the project team needs to see what. Some of these decisions are predetermined, like sending a plumbing shop drawing to the M/E/P engineer, but others require reasoned judgment. While it is not always possible for the project manager to look at every project document or file that is received, he or she must know who is responsible to look at what and when it must be looked at. The project manager must either decide who will receive what or set up the protocol for others to make that decision. If the firm does not have a central receiving station where mail is received and stamped, the project manager should decide who on the team will receive mail and how it will be dated and distributed.

Project filing system. A project filing system must be flexible and comprehensive enough to accommodate many types of project information. This includes letters,

SAMPLE PROJECT FILING SYSTEM

- 01 Accounting
  - 01 Agreements
    - 01 Owner-architect
    - 02 Owner-contractor, general conditions
    - 03 Consultants
    - XX Other
  - 02 Invoices
  - 03 Expenses
  - 04 Insurance
- 02 Marketing
- 03 Correspondence
  - 01 Owner
  - 02 Contractor
  - 03 Consultants
  - XX Other
- 04 Meeting Agendas and Reports
- 05 Memos and Lists
- 06 Project Data
  - 01 Project summary
  - 02 Project directory
  - 03 Codes
  - 04 Estimates
  - 05 Bids and addenda
  - 06 Schedules
  - 07 Site data
  - 08 Reference
  - 09 Photographs
  - XX Other
- 07 Drawings
  - 01 Architectural
  - 02 M/E/P
  - 03 Structural
  - 04 Consultants
  - XX Other
- 08 Specifications
- 09 Construction Administration
  - 01 ASIs, RFIs, CCDs
  - 02 Observation reports
  - 03 Submittals
  - 04 Logs
  - 05 Certifications and payments
  - 06 Change orders
  - 07 Closeout
  - XX Other
- XX Other

memoranda, e-mail, sketches, drawings and specifications, submittals and shop drawings, test reports, and surveys. Some of these items will be physically filed, some will probably exist only electronically, while others will be drawings, oversized materials, and physical samples. Information, regardless of its type, must be preserved in an orderly manner so it can be easily searched and retrieved. Some firms and managers, not realizing the critical importance of a project filing system, essentially use the "read and stack" method, resulting in waist-high piles of unsorted, though possibly chronologically stacked, information.

When trying to locate information that has been filed, predictability is essential. This is important for the project team as well as others who may need to access and use the project files. To make it easier to find material, most firms—large and small—develop a standard filing structure. As electronic files increasingly replace paper files, the electronic file directory structure should closely track the paper file directory structure. This means whether searching in your metal filing cabinet or on your desktop computer, you will be in familiar territory. A sample directory structure that is effective for both paper and electronic files is shown in the accompanying sidebar. Additional files can be created as project-specific needs arise. For example, if the project is a theater, there will probably be an acoustical consultant file. A firm designing small projects might require fewer file categories. Firms with larger or more complicated projects may develop a more extensive system than the one illustrated.

MONITORING THE PROJECT

The project manager's best efforts will not be sufficient if he or she does not monitor the progress of the project against project goals and objectives, the responsibilities established in the owner-architect agreement, and what is required by the standard of care.

Tracking Required Services

Project services are established by the architect's contract with the owner as well as what is expected by the standard of care for such services.

The agreement. Project managers should keep a copy of the owner-architect agreement in a notebook at their desks at all times. As questions about services arise, the manager can refer to the contract to see if the issue is addressed. The manager should make a checklist of any contract-mandated reports or notices, schedule them, and monitor whether they are being implemented. For example, the contract may require written notice of the architect's awareness of a schedule delay. Effective project managers understand that compliance with contract requirements is *not* optional. Monitoring whether contract provisions are being met is a serious responsibility. For this reason, the project manager should have a copy of the agreement at the ready, and read it often enough that it is dog-eared and annotated to excess when the project is concluded.

Standard of care. Not all activities the architect carries out on a project are described in a contract. Things not described might include, for example, making a subjective judgment as to how complete a set of drawings must be or how often the architect should visit the job site during construction. Such matters relate to the "standard of care" concept, which can be stated in many different ways but essentially boils down to the notion that the architect is required to do what a reasonably prudent architect would do in the same community, in the same time frame, given the same or similar facts and circumstances.

There should be no confusion about the standard of care, which is used in the courts for adjudicating cases involving the work of design professionals. From time to time, the project manager must step back and take an introspective look at the project and the services he or she is managing. If this observation reveals something is missing, or services are not running smoothly, the manager should take corrective action.

If one of the project parameters of scope, cost, or quality is changed, it will affect one or both of the other parameters; thus, a change in one component should not be considered without evaluating the impact on the others. The project manager should keep all issues on the table during change discussions and determine that the owner fully understands these dynamics and the potential result of any change.

James B. Atkins, FAIA

Monitoring Client Objectives

The architect designs a building to accomplish as many of the client's stated goals and objectives as possible. Those objectives are generally focused on the scope of the project, its cost, and its desired quality. Careful attention must therefore be given to how closely the design accommodates these objectives. The project manager should make frequent comparisons of the current design to the client's objectives. If gaps or differences between the design and the client's objectives are found, the manager must take corrective action. This could mean reviewing the differences with the client to determine if the design, the construction budget, or the level of quality should be revised. Small corrective measures could simply require minor revisions to designs or candid discussions with the client.

Project program. Clients establish programs for their project to define project uses, the project size or scope, and the desired quality. The project manager must monitor how well an evolving design addresses each of these programmatic elements. This may include periodically preparing floor-area tabulations to check the project size or obtaining samples of proposed materials and finishes to verify compliance with quality goals. It could also involve checking the detailed program to verify that the design accommodates the intended uses.

Construction budget targets. Although most architects are not construction cost estimators, the project manager should understand the relationship between scope, quality, and cost. The manager should have a good enough grasp of all aspects of the project to be able to make appropriate recommendations for scope or quality adjustments in the event cost estimates or bids exceed target construction budgets.

By far the best approach to meeting client expectations for construction budgets is to carefully monitor the relationship between scope, quality, and cost as a design is being developed. Architects and clients alike are frequently tempted to look past a potential conflict between budget and estimated construction costs, hoping the conflict will be resolved in competitive bidding or subsequent events.

The best practical way to resolve such conflicts—although it may be a painful experience—is to sit with the client and review and adjust one or more of the project parameters of quality, time, and cost before proceeding to the next step in the design process. To help stay on top of this issue, budget compliance or adjustment problems should find their way into meeting agendas and be discussed regularly with the client and the project team. Any statements of probable cost provided by the architect, or required by the contract, should be discussed frequently and provided at required project milestones.

► Project Controls (9.3) provides additional information on monitoring and controlling project budgets.

Managing consultants. The way to "do better work" for many projects involves finding a better solution to coordinating with the work of consultants. Architects and consultants face similar problems in project delivery, such as:

- Reaching the finish line at about the same time to avoid disruption when documents are issued for bidding or construction
- Making sure all parties are using the same versions of the plan backgrounds
- Uncovering and coordinating conflicts between the work of different disciplines

Project managers must allot time and resources to attend to challenges such as these.

Quality management. Some project managers believe that quality management and quality control are relegated to the technical guys in the back room. Nothing could be further from the truth. In managing and controlling quality at the project level, quality must be a daily concern of the project manager. As with other management responsibilities, this does not necessarily mean holding a red pencil and constantly marking up the efforts of the people producing the work, any more than the project manager is required to actually prepare the drawings and specifications, although some project managers may choose to do so. It does mean the project manager must know the status of the work at all times and must oversee and direct quality management controls as they are performed.

Responsibility for document reviews. The project manager should consider document reviews as an opportunity to uncover mistakes and other conditions before they create problems during construction. However, many managers are reluctant to invite the criticism that results when documents are reviewed, possibly fearing being perceived as poor managers when scrutiny reveals deficiencies in the work they are directing. The irony of this thinking is that the contractor and subcontractors—through requests for information and change orders—will surely discover deficiencies that make their way into the construction drawings and specifications.

The project manager should schedule both time and resources for internal reviews of the project construction documents, if possible before the project is issued for bidding or negotiation. In small firms, the review might be made directly by the project manager. In large firms, the manager may select a reviewer, often a leader from another project. Specification writers can provide valuable internal peer reviews as their familiarity with the project helps them coordinate terminology between drawings and specifications and identify areas in the drawings where materials or systems have not been correctly represented.

The manager should always be present when review results are presented. Project managers sometimes are tempted to skip these sessions because they are tedious and technical. However, the identification and correction of errors and omissions in the architect's work is an important enough occasion to merit the attention of the primary project leader or leaders. Despite its advantages, peer review checking should not be viewed as a substitute for thorough coordination or creation of a reference set prepared by the project team.

External review of the project documents can also be useful. The project manager should welcome such reviews, whether they are provided by owners, contractors or subcontractors, agencies to which applications have been made for building permits, or architects or engineers specializing in plan checking. Most external reviews provide an excellent opportunity for the project manager to improve the quality of drawings and specifications.

DOCUMENT CHECKLISTS

A commonly understood checklist is the airline pilot's preflight checklist. It is obvious pilots do not use this checklist to learn how to fly the plane, but rather to make sure they have attended to myriad minor details required before takeoff. Architects should rely upon checklists in the same way. Document checklists for design professionals are not teaching devices to communicate how to prepare a well-checked and coordinated set of documents. Rather, they are a way to validate and attend to the many professional requirements for preparing project documents. Two common-sense guidelines should be applied to the design and use of project checklists:

- *Tailor checklists to the project.* Not all projects are exactly the same. A checklist that applies to one project may not apply strictly to another. For example, a checklist developed for a hospital may not cover the issues that require attention when checking the documents for a new high school. Checklists must be customized for optimal utility on specific projects.
- *Keep checklists simple and manageable.* While checklists must be specific enough to get to the heart of matters an architect or firm has experienced on similar projects, they must not be so detailed as to be cumbersome. Architects are more likely to employ checklists if they are easy to use.

Adapted from Grant A. Simpson, Chapter 10, "Document Checking and Coordination," in the *Emerging Professional's Companion* (www.epcompanion.org).

Internal Budget Tracking and Management

Most project managers are asked to allocate portions of the fee to the various project phases in a proportion that matches the anticipated workload for each phase. Referred to as a job cost budget or a project budget, the purpose of these estimates is to budget for the firm's labor and other expenses and profit. Expenses include basic service consultants, unreimbursed expenses, and reimbursable expenses. Producing a realistic project budget requires an understanding of the firm's labor rates and project delivery and staffing practices. As the work progresses, the project manager periodically checks actual costs against the budget plan.

Some firms develop their labor budgets using worker-hour estimates only. When dollar-based estimates are preferred, firms may use actual employee hourly costs or average hourly costs. The advantage of worker-hour-only or average hourly cost methods is that they remove any incentive to reduce costs by choosing only low-priced and/or potentially less experienced staff for the project. Considering that most firms

▶ AIA Document D200–1995, Project Checklist, lists tasks (organized by phase) that architects may perform on projects.

INVOICING TIPS

To avoid billing disputes, a project manager may consider not invoicing for the total of a recently completed phase of work. For example, if the client has "approved" schematic design and authorized design development to proceed, schematic design might be invoiced at 95 percent completion with the remainder billed when design development reaches perhaps 50 percent completion. A client who may be tempted to hold up payment and question whether schematic design is 100 percent complete, may pay the 95 percent, and won't question the 100 percent once design development is 50 percent complete.

Similarly, project managers may consider invoicing reimbursable expenses separately from basic service fees. Doing so may help prevent a hold on a large basic service invoice because of a dispute over a telephone charge or a meal expense.

calculate profit for distribution at the end of the year based on the firm's total income and expenses, even when employee-specific costs are used, everything averages out by the end of the year. However, for the firm's senior management, having access to and reviewing actual employee-specific costs means the exact financial position of each project can be determined at any time.

Integral to the preparation of the internal budget is reviewing and tracking client invoices and collections. Many firms ask the project manager to review the client invoice before it is sent and to watch over any aging invoices.

Tracking employee time records. Project managers in most firms check the time records of the employees they supervise on an ongoing basis. The time records are approved and sent to the accountants. If corrections are required, they are first returned to the employee.

Consultant invoices. The project manager also reviews invoices from consultants to determine whether the consultant's progress matches the amount invoiced. To simplify this process, some firms pay their primary consultants—such as structural and M/E/P engineers—on the same percentage complete basis as the invoice the architect submits to the client. In this approach, only reimbursable expense invoices are required from these consultants. However, some adjustment of payments is usually required when the consultant's work progress doesn't match the architect's progress, as would be the case with contract administration fees for the structural engineer, who is usually finished before the architect.

Reimbursable expenses. Most architects pass on certain expenses to the client, such as those for out-of-town travel and living, reproduction and printing, photography, postage and shipping, and renderings and models. The way reimbursable expenses will be handled or marked up is typically defined in the owner-architect agreement and must be coordinated and tracked to match the contract requirements.

Client invoices. Invoices should be reviewed before they are sent to the client to determine that the amount billed represents the status of the work that has been completed. This should involve making sure the work being invoiced matches current client work authorizations. Reimbursable expenses should be checked against contract provisions—particularly if there is a limit on the amount to be reimbursed. Some firms believe the close working relationship that project managers have with clients puts them in an ideal position to discuss any overdue invoices. Other firms prefer not to put managers in an adversarial position with clients if there are disputes about amounts due. To reduce or avoid payment disputes, the architect should make sure the client has a clear understanding of the potential ramifications of unpaid and overdue invoices before work commences on the project.

► For information about invoicing clients, see Financial Management Systems (5.2).

Project status and progress reporting. The project manager tracks all of the project expenses mentioned above through the firm's accounting status and reporting system. Rather than using paper copies of reports, most of today's accounting software for architecture firms can be accessed online via the Internet or a company intranet and checked from time to time at the convenience of the project manager. Developing a routine for checking project status will help prevent unpleasant financial surprises.

CONCLUDING THE PROJECT

This management activity encompasses closeout tasks, such as delivering warranties and operating manuals to the owner, and housekeeping activities such as archiving project files. This activity should also include investigations to determine the quality of the

services that were provided and efforts to obtain opinions from the owner, and possibly the contractor, about those services.

Post-Construction Evaluation

The most valuable insight into the effectiveness of the architect's services can come from discussing those services with the owner and contractor immediately after occupancy of the project. At this time, minor irritations and recollection of bumps in the road are still fresh in their minds. While no architect wants to be beat up over minor issues, all want to improve the quality of their services. If a project is successful, the client and contractor may later decide not to mention the little things. The reality of professional service is that what the clients and contractors experience—as users of the architect's services—counts a great deal in determining the quality of the experience. Following are several ways to carry out post-construction evaluation.

Team roundtable and project debriefing. When construction is complete and the architect's services are concluded, the project team may be scattered to the winds. Still, the project manager should gather the remaining troops and share insights gained from discussions with the owner and contractor, as well as detail the degree to which the firm's quality and financial goals were met. An equally important objective of a project debriefing is to allow members of the project team to discuss their experiences, and to offer suggestions and ideas for improving work on future projects.

Year-end review with the client. While it is ordinarily an additional service, many architects make a postoccupancy evaluation part of their normal services, especially with repeat clients. A walk-through or even an inspection is conducted approximately a year after occupancy. This is done with the owner, supervisory personnel, and operations and/or maintenance staff to compare programmed use with actual use, the effectiveness of the design, and the performance of materials and systems. The year-end review allows the architect to reinforce the positive aspects of the relationship with the client. It also provides a heads-up on any problems the owner may be having with the project. While no one enjoys learning of problems that may be brewing, it is certain that bad news—if it is present—does not get better with age.

Mistakes are reality. Although no one likes reliving the mistakes they have made, mistakes are a reality. Architects rarely prepare perfect sets of drawings or provide perfect services. As the project team explores what they did wrong or what they can do differently next time, the project manager should remind them that the purpose of revisiting project experiences is to improve the architect's services—not to castigate participants. Nonetheless, when discussing mistakes, particularly with the owner, an attitude of contrition is preferable to one of defensiveness.

Project Archives

The basic rule to follow in archiving is, "If it is not in your file, it doesn't exist." All firms need an established way for closing projects. Most states have a minimum period during which project records must be stored. Other reasons for archiving records might include providing facility management information down the road, saving information to be used in a future renovation, and, less cheerfully, the potential need to document a defense in the event of a claim or a lawsuit.

LEMONS TO LEMONADE

Reality dictates that mistakes will always occur, no matter how much effort is made to avoid them. An ambitious goal is to strive to eliminate repetitive errors. If that could be done, only original, never-before-experienced mistakes would need to be addressed. Realistically, this may never be achievable; nonetheless, it is a prudent career objective.

There are many approaches to designing and detailing any built condition. Some ways are better than others, some ways are just plain wrong, and no way is absolutely perfect. Experiencing the wrong approach can provide benefits—but only if the correct way is learned as a result. Over time, learning from each misstep helps architects progressively improve their skills and the products of their services.

Every project in architecture is in some way a new adventure because no two projects are exactly the same. Most clients do not wish to commission a building exactly like the one across the street. The quest for originality leads architects to continuously attempt new actions and endeavors, with their concomitant learning curve. However, as Albert Einstein said, "A person who never made a mistake, never tried anything new."

Grant Simpson and Jim Atkins (adapted from AIArchitect, *December* 2005)

MORE THAN A SERIES OF TASKS

Project management is critical to any architecture firm committed to providing excellent services. While the expansive nature of project management can be challenging to describe, its basic tasks include determining who, when, and how the work will be done; directing and leading those who will do the work; tracking how progress compares to what was planned; taking action to make course adjustments when deviation from the plan is required; and evaluating and communicating how well the work was performed.

Yet project management is more than just a series of tasks. The project manager embodies professionalism, accountability, and integrity. In line with these more subtle and less apparent qualities, project management can also be viewed as an attitude and a way of going about one's work. For these reasons, a wise architect or other design professional will remain a student of project management throughout his or her career.