

CHAPTER 22

PEER REVIEW

Peer review is an independent assessment of a business organization, project, or technical process. This chapter discusses two types of peer reviews: organizational peer reviews and project peer reviews. In some professions, peer reviews carry a negative connotation, but not in design and construction, where a peer review is an affirmative tool available to the project team for improving efficiency and effectiveness and enhancing quality.

Organizational peer reviews address the typical workings of a firm or agency as a whole, including policies, procedures, and practices. Organizations include project owners, design professionals, and constructors; they can be privately owned or a governmental entity.

Project peer reviews, in contrast, focus on a single project and usually focus primarily on either design or management. Project design peer reviews (sometimes called project performance peer reviews to broaden their scope beyond design) examine in detail the technical results or recommendations for all or part of the project at its current stage of development.

Peer reviewers are design or construction professionals who have experience with similar organizations or projects and who are typically managers or senior technical persons from another organization. Reviewers thus have a fresh perspective that allows them to act independently.

The scope of the peer review is specified by the organization's manager or project team member who commissions the review. The review might cover issues of technical design, project management, or the overall management of team member organizations. The peer review processes described in this chapter are typical for traditional design-bid-build project delivery, but in most cases, they are applicable to design-build and other forms of project delivery.

22.1 GENERAL FEATURES

Organizational and project peer reviews have the following general features:

- The purpose, scope, format, and duration of the review are well defined to help distinguish it from other, less systematic reviews;
- The technical or managerial expertise of the reviewers—industry peers of the owner, design professional, or constructor—is usually similar to or greater than that of the professionals being reviewed;
- The organization or project reviewed by an independent peer or team of peers benefits from the broader range of experience brought to bear;

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Types of Peer Reviews

1. Organizational
2. Project
 - Design (or performance)
 - Management

***Wonder, rather than
doubt, is the root of all
knowledge.***

Abraham Heschel

- The parties involved give the review special attention in acknowledgment of its potential benefits;
- Peer review observations are disseminated in a timely fashion to appropriate individuals, especially those whose activities are the subject of the review;
- The peer reviewers serve in an advisory capacity; they do not have the authority to recommend solutions to the problems or issues that surface, unless clearly requested to do so.

Peer reviews differ from other reviews in several respects:

- Peer reviews do not signal that an organization or member of a project team is incompetent or suspect; rather, observations of or participation in a peer review demonstrates a commitment to improve quality, efficiency, and/or organizational effectiveness;
- Peer reviews are conducted only by people who have not been involved with the organization or project;
- Peer reviews are not required by a regulatory agency;
- Peer reviews are more than a constructability review, although reviewers often inquire about assumptions affecting construction.

To succeed, a peer review requires adequate resources, including budget, time, and effort. Advance planning can keep peer reviews from being disruptive. The benefits of a peer review usually outweigh the costs, often by orders of magnitude.

22.2 TYPES AND BENEFITS OF PEER REVIEW

The following sections discuss the two types of reviews that are most frequently encountered in the construction industry: organizational reviews and project reviews.

Peer reviews deliver many benefits that enhance quality for individual projects, as well as for the organizations involved. Benefits occur even before the review begins: a peer review signals that managers care enough about quality and efficiency to ask their peers to point out possible improvements in their work, or participants acknowledge that a project or organization is important enough to warrant outside opinions. Therefore, the preparation for a peer review is also a benefit, as it requires participants to bring a new level of focus on their work and procedures.

The leverage gained from just one project or organizational "shortfall" can be immense. In either case, for example, it is not uncommon to find that there is a significant contract or legal liability that is exposed. Project peer-reviewers might discover that QA or QC procedures are not being followed according to either company policy or the project requirements. While nothing dire might have followed from these discovered "gaps," something dire could have, equaling one potential benefit. And, by discovering them before they became dire, the processes and procedures needed to correct them can be put in place sooner. This latter benefit has long-lasting application.

Experience shows that more than one discovery is normally made during any peer review; in fact, many may be. Hence, the potential benefits of peer review can be significant.

22.2.1 Organizational Peer Review

Organizational peer reviews independently assess the operations of a design or construction organization (private or public) in light of how faithfully the organization's stated overall policies and practices are actually practiced.

These reviews can focus on an entire organization, on portions of it (e.g., certain locations), and/or on certain operations. For example, an organization composed of five office locations might choose to have its main office and one branch office reviewed and have the reviewers cover project management, quality management, financial management, human resources, and the organization's IT infrastructure. This would mean that the reviewers would not review the organization's sales and marketing functions, executive leadership, strategic planning, and ownership transition, to name but a few other options. Peer reviews of this type can span from one to four days, involving from one to four peer-reviewers, depending on scope.

Organizational peer-reviewers are looking to find both what is and what is not operating according to the stated objectives of the organization. Generally, they need to obtain material that describes the organization's plans, policies, and procedures, and they often survey a sampling of the organization's population prior to the actual, on-site review. Upon completion of their review, they brief a pre-selected group from the organization on their findings. While they overview what is working well, they focus more intently on gaps, issues, and problems that they have uncovered and offer their observations for consideration. They refrain from making specific recommendations on how to solve the problems they uncover, since there could be many suitable and unsuitable solutions that only further study by the organization can determine. They may also be requested to submit a written report which summarizes their findings.

22.2.2 Project Peer Review for Design

Project design peer reviews—both design reviews and the less frequent project design management reviews—involve a separate, structured, focused, and thorough fact-finding process conducted by one or more senior professionals who are independent from the project team. Before either type of review begins, the reviewer(s) work with the owner, design professional, or constructor to develop a detailed scope of the review. This scope includes the functions to be reviewed, the process to be followed, the schedule, and the form of reporting.

A project management peer review is essentially an organizational peer review applied to a single project, rather than to the entire organization, and can be carried out by adapting procedures of organizational peer reviews (see section 22.2.1). Hence, the discussion of project peer reviews in this chapter refers to project design peer reviews only.

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A distinguishing feature of a project design peer review is that its scope goes beyond routine standard procedures and daily quality control checks. For instance, a critical structural connection might be peer-reviewed using an independent method of analysis or for the effects of cumulative dimensional tolerances, the sequence of fabrication or erection, or loads other than those assumed by the designer.

One or more of the following circumstances might suggest that a project peer review would prove useful:

- The project is larger or more complex than is usual for the team;
- Technological innovations are involved;
- Previous similar projects have experienced difficulties;
- Project objectives have changed during design, or disputes have arisen;
- The project team includes several offices or many different organizations;
- The project involves a rapid or fast-track schedule;
- Budgets for developing or implementing recommendations are limited;
- The number or qualifications of staff personnel are a concern, including apparent over-commitment or the recent departure of key persons;
- The project involves large potential liabilities to the owner, design professional, or constructor or poses unusual risks to the public;
- The status of work performed to date is in question;
- The project involves special environmental concerns.

Project design peer reviews can examine an entire project but usually are more limited in scope. They often occur at the completion of design, but there are advantages to holding a review at the earlier key milestones. Project peer reviews can also be performed during construction, or even upon project completion (as a benefit to subsequent projects). Therefore, the scope of a project peer review is defined when the review is authorized and necessarily reflects the current state of project completion. Typical scopes include inquiries into the following:

- Design assumptions or criteria;
- Applicable codes and regulations;
- Accuracy of calculations (in designated areas or by spot check);
- Clarity and completeness of reports or design documents;
- Appropriateness of selected actions compared to alternatives identified;
- Application of good judgment;
- Constructability of the design;
- Construction means, methods, and techniques proposed or employed;
- Prospects of meeting project objectives.

Despite certain similarities, the project design peer review is not a value engineering study. Value engineering assumes an adequate design and attempts to match the effectiveness of the design while reducing cost, whereas a project peer review focuses on the quality of the design in meet-

ing the project objectives (while still being cognizant of cost). Value engineering focuses more upon whether the right overall solution is being pursued, while design peer review examines whether the selected solution is being engineered correctly.

> Chapter 25, "Value Engineering"

22.3 PROCEDURAL ELEMENTS OF PEER REVIEW

Peer reviews of either organizations or projects follow six general steps: commissioning the review, developing the scope, selecting the reviewer(s), examining documents, conducting on-site interviews, and reporting. Subsequent follow-up actions may be advisable for the clarification and acceptance of findings and assurances, where appropriate, that corrective actions will be taken. The following sections discuss these procedures in more detail, highlighting similarities and differences in organizational and project design peer reviews.

> See 22.5.2, "Project Design Peer Reviews," for the *Agreement Between Owner's Designer and Project Peer Reviewers for the Professional Services for Independent Project Peer Review*

22.3.1 Request for Peer Review

A peer review begins when one of the parties involved formally requests that a review be conducted. In the case of organizational reviews, this request often comes from management as part of an organization-wide quality enhancement process. Reviews are especially effective for large organizations seeking to improve the performance of individual operating units. Organizational peer reviews might also be mandated by an owner or required by a regulatory agency as part of an approval process.

Project design peer reviews can be requested by any member of the project team (owner, design professional, or constructor) or by one or more regulatory agencies having jurisdiction over the project. In most circumstances, unless the review is requested by the designer or constructor, the owner authorizes the review and pays the associated costs.

22.3.2 Establishing Scope of the Peer Review

The scope for a peer review should be focused and well defined, distinguishing it from other, more general reviews.

22.3.2(a) Organizational Peer Review

An organizational peer review can focus on procedures for carrying out projects or address all aspects of management of an organization. The organizational peer review begins with an agreement or authorization and proceeds typically through the following steps:

- Defining scope of the review, including resources and time required;
- Selecting reviewers;
- Collecting documentation defining organizational processes, policies, and procedures;
- Organizing and implementing surveys of stakeholders;
- Interviewing stakeholders and conducting on-site visit(s);
- Collating and organizing findings;
- Reporting on findings.

The organizational peer review may verify the adequacy of office facilities, libraries, support for field services, and the management of "low-tech" or non-technical equipment. The review team may critique personnel policies and professional development programs, or lack thereof, as well as procedures or opportunities for sharing professional experiences. As a rule, a review includes all facets of an organization's practice, from line activities, to distinctive staff functions, to looking at marketing activities and relationships with external organizations.

The scope of organizational peer reviews is often standardized by recognized programs.

22.3.2(b) Project Design Peer Review

The scopes of project design peer reviews vary widely. While reviewers might be asked to look only at a project's final design documents, the process generally delivers more benefit when conducted at earlier points in a project's design phase, as well as, occasionally, during construction. All parties should be apprised in a timely manner of the proposed use of the review.

Project design peer reviews can be commissioned as early as the planning for design phase of a project. A review at this point provides the owner with an independent assessment of the proposed design, presumed construction processes, and design schedule. Irrespective of project phase, however, a project design peer review scope calls for a report to be delivered immediately upon completion of the review. The scope might state that the delivery of the report signals the end of the peer review for the project or for that phase; or the scope might involve the review team in evaluating follow-up activities. Because of the many variables involved in setting the scope of a project design peer review, all participants benefit from investing ample time in the scoping process.

22.3.3 Selecting Reviewers

Accomplished peer reviewers are independent thinkers, good communicators, and contributors to excellence in their professions, regardless of the type of review.

The independence of the review team starts with the selection of members from outside the organization or office being reviewed. Peer reviewers rarely come from within the same organization, and then only if they are sufficiently removed in authority and geographic location from those whose work is being reviewed.

Peer reviewers should be qualified, well-regarded senior professionals, experienced with similar organizations or projects, familiar with governing regulations, and widely accepted as being ethical, objective, and thorough. The team could include reviewers from varied disciplines, including environmental scientists, economists, estimators, and experts from other construction fields. Several professional associations offer formal organizational peer review programs with training and certification.

The size of the review team depends upon the scope and complexity of the peer review. A team normally consists of two or more reviewers, although single-person reviews are possible for smaller organizations or projects.

22.3.4 Preliminary Document Review

All peer reviews begin with an examination of documents provided to the review team before they meet as a team. These documents serve to introduce the organization or project. Preliminary peer review information might include confidential questionnaires completed by appropriate staff.

22.3.5 On-Site Document Review and Personal Interviews

When the peer review team arrives at the sponsoring organization's office, reviewers go over additional documents and conduct confidential interviews with key personnel and a cross section of other employees or team members.

In an organizational peer review, personal interviews provide reviewers with first-hand information about the organization and its goals. The managers and staff interviewed have the opportunity to share their perspectives on how the organization is performing in key areas, including administration, quality assurance, quality control, user satisfaction, project controls, field activities, and overall direction. The confidential nature of these interviews aids in eliciting candid observations.

Project design peer reviewers generally develop preliminary conclusions about the project's status or technical quality based upon an on-site evaluation of relevant documents and then augment the results of this document review with personal interviews of managers and staff. This consideration of both written and oral information helps the review team determine the extent to which project design assumptions and goals are understood and are being implemented.

In both kinds of reviews, the primary task of the peer reviewers is to compare their findings to the stated objectives of the project or to the processes and procedures that are specified by the organization for conducting its business. They are, therefore, first called upon to, in effect, perform a gap analysis. Unless specifically requested otherwise, they are not asked, nor should they volunteer, to recommend specific solutions to problems or issues identified. It is up to the organization or project team to decide how to address any issues or problems addressed in the peer review report or findings.

22.3.6 Reporting

Peer review reports are of great interest to those being reviewed. In addition to the impact on the industry reputation or public perception of an organization or project, the influence of peer review reports can affect the professional status of the people involved. Therefore, the structure, tone, and delivery of reports for both organizational and project design peer reviews are crucial. The report should be distributed according to the parameters established in the agreed-to scope for the review.

Organizational peer reviews are confidential. These peer review reports are often informal and delivered orally. Reports should remain within the established scope, noting areas of compliance and patterns or instances of unmet responsibilities, contract problems, inappropriate behaviors, or authorization issues. The report might also provide insight or identify areas or items for improvement.

If an organization is large or has multiple offices, the organizational peer review report might be delivered to either the top managers of the office that commissioned the review, or only to the office reviewed. Following the delivery of the report, the review team usually destroys the notes and documents created during the review to ensure the confidentiality of the process. At this time, they also return all documents that were provided to them by the organization.

In the case of a project design peer review, many issues can be resolved informally by direct communication between the designer and the reviewers. Unresolved or major issues concerning the owner's requirements, as set forth in the scope of the inquiry, are included in the written report.

Unlike typical organizational peer review reports, reports of project design peer reviews are generally detailed, not confidential, and submitted in writing to communicate accurately the review team's technical conclusions. Typical reports include the following sections:

- Scope of the review, including limitations;
- Current schedule and the status of the project;
- Phase being reviewed;
- Identification of needed corrective actions;
- Issues for further evaluation and consideration.

For both organizational and project design peer reviews, balance is an important aspect of the report; favorable comments, as well as critical ones, are helpful in assessing performance. Peer-reviewers should avoid imposing their own personal preferences without appreciating other acceptable practices. Further, peer review reports do not in themselves call for required actions but are intended to guide decisions by pointing out potential items and areas for improvement. In many cases, informality is an asset in achieving this goal.

22.3.7 Follow-Up Actions

Without clearly defined follow-up or action items after the delivery of the report, the full benefit of any peer review to the organization or project can be lost. In some cases, the authority commissioning the review can simply order that the findings be addressed, through reconciliation or corrective action. In other cases, those being reviewed should accept the responsibility to address the findings.

Offices that voluntarily seek either type of peer review tend to take the findings seriously and work to implement them in a constructive spirit. Establishing measurable goals and a realistic schedule are key aspects of successful implementation of the findings.

Upon the conclusion of the review, the authority commissioning the review acknowledges completion and releases the team. At that point, the parties complete any remaining administrative actions, including compensation, certificates of completion, and any other appropriate documentation.

22.4 RESPONSIBILITY

While the goal of the peer review process is to enhance project or organizational quality by soliciting the input and advice of external parties, the responsibilities of the organization or the professionals reviewed remains the same. Organizational peer reviews lead to the organizations themselves adopting or rejecting findings. Project peer-reviewers are not authorized to make changes or direct others to make changes in project documents; they have no authority over organization or project personnel, and the original professionals retain their legal responsibilities.

22.5 PEER REVIEW PROGRAMS AND RESOURCES

The following two sections offer additional resources for organizational and project peer reviews.


22.5.1 Organizational Peer Reviews


Some professional associations offering standardized organizational peer review programs for design professionals, generally costing only reimbursement of direct expenses plus a modest honorarium for the reviewers, are

- ASFE, an organization of professional firms practicing in the geosciences, which developed the first organizational peer review process in 1978;
- The American Council of Engineering Companies (ACEC), which expanded the ASFE program and adapted it for all private engineering and architectural design firms in the United States, Canada, and Mexico. The ACEC-sponsored program has been endorsed by ASCE, the National Society of Professional Engineers (NSPE), and the American Institute of Architects (AIA) for all engineering and architectural firms. Peer reviews have been conducted by ACEC in English, French, and Spanish;
- The American Society of Civil Engineers (ASCE), which administers an organizational peer review program for governmental agencies that is similar to the ACEC program;
- The Associated General Contractors of America (AGC), which has a voluntary program that can be implemented by groups of interested firms.

22.5.2 Project Design Peer Reviews

Several large project owners, designers, and constructors have also established in-house project design peer review programs. The Engineers Joint Contract Documents Committee (EJCDC) has developed a *Standard Form of Agreement Between Owner's Designer and Project Peer Reviewers for Professional Services for Independent Project Peer Review*. Since EJCDC is made up of representatives of ACEC, ASCE, AGC, and NSPE, this guideline offers a standard to help make the framework for project peer reviews more consistent, cost-effective, and successful.

 **Organizational Peer Review Resources:**
<http://www.asfe.org>
<http://www.acec.org>
<http://www.asce.org>
<http://www.aia.org>
<http://www.agc.org>

 EJCDC Doc. E-581, *Agreement Between Owner, Design Engineer and Peer Reviewers for Professional Services for Independent Project Peer Review, 2011*

SUMMARY

A project peer review is a high-level action taken to improve the efficiency, effectiveness, and quality of projects that organizations undertake. An organizational peer review goes further and examines the policies and practices of an organization across many of its projects and activities. A project peer review focuses intensely on a single project, perhaps even on a single phase at a time or a single component of the entire project.

Peer reviews are requested as an added measure to improve quality. Many leaders familiar with peer reviews have encouraged their use by large or small organizations and on large or small projects. A fresh, unbiased, and diplomatic review by one or more professionals can be a highly cost-effective management initiative measure that may help avoid unnecessary and even costly mistakes, close unrealized gaps in an operation or process, and reduce costs and overall time required to complete a project. □

Chapter 22: Peer Review Typical Responsibilities *

Responsibility ↓	Owner	Design Professional**	Constructor**†	Design-Builder
Commission the review	● ***	⊙ ††		⊙ ††
Establish scope	●	⊙ ††	⊙	⊙
Provide sufficient budget and schedule resources	●	⊙ ††	⊙	●
Select reviewers	●	⊙ ††	⊙	●
Participate in interviews, document reviews, and other activities	⊙	●	●	●
Adopt report	●	●	●	●
Implement recommendations	⊙	●	●	●

* Responsibilities apply to project design peer reviews. For organizational peer reviews, the organization itself holds primary responsibility for the general tasks above.

** For design-bid-build situation. In a design-build situation, the Design Professional and Constructor are part of the Design-Builder team.

*** A regulatory agency, acting on its own or enforcing a regulation, could require a project peer review as a condition of permitting.

† The Constructor is generally not involved unless invited at the time a project peer review is initiated and is specifically invited to participate, or unless a design-build delivery system is being used.

†† The Design Professional (or Design-Builder) can initiate a project peer review of his or her own work at any stage of a project, in which case the designer is responsible for carrying out all responsibilities alone.

● = Primary Responsibility ⊙ = Assist or Advise