

IN-LB

Inch-Pound Units

SI

International System of Units

Responsibility in Concrete Rehabilitation Construction—Guide

Reported by ACI Committee 132

ACI PRC-132.2-22



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Responsibility in Concrete Rehabilitation Construction—Guide

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Responsibility in Concrete Rehabilitation Construction—Guide

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This guide identifies and suggests allocation of responsibilities to various parties involved in concrete rehabilitation in the United States; however, the guidance presented may apply to contractual relationships addressing concrete construction in other parts of the world. This guide can be useful in evaluating existing contract documents for adequacy and balance with respect to responsibilities in concrete rehabilitation projects.

In some cases, the responsibilities outlined carry the force of law. In others, there are options that could be incorporated into a particular contract.

Keywords: concrete rehabilitation; contracts; responsibility.

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Reference to this document shall not be made in contract documents. If items found in this document are desired by the Architect/Engineer to be a part of the contract documents, they shall be restated in mandatory language for incorporation by the Architect/Engineer.

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ACI PRC-132.2-22 was adopted and published in March 2023.

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CHAPTER 1—INTRODUCTION AND SCOPE

1.1—Introduction

The term “rehabilitation” (the process of repairing or modifying a structure to a desired useful condition) is used herein, as it includes the repair, modification, and alteration of an existing structure to a desired condition of service-

ability to comply with the owner’s needs, and is the intent of this document. The responsibilities of each party in a concrete rehabilitation project are delineated herein, an example being the owner’s obligation to establish project objectives, budget, schedule, durability, and expected service life of repairs. These and other requirements should be adequately described in the contracts between the parties. It is essential that the party controlling the contract process (usually the owner or an owner’s representative) recognizes the steps necessary to determine repairs and modifications to achieve project objectives and to assign consistent responsibilities among the parties. Clarity and consistency in the responsibilities defined in the contracts will reduce disputes.

1.2—Scope

This guide describes the responsibilities of various parties involved in assessment, design, execution, and inspection of the rehabilitation of concrete structures in the United States. While the document is primarily directed to projects in the United States, the guidance presented may be applicable to contractual relationships addressing concrete rehabilitation in other parts of the world. Consistent with **ACI 562**, this guide is applicable for repair and rehabilitation of existing structural concrete buildings; members; systems; and, where applicable, nonbuilding structures including, but not limited to, parking decks, tanks, equipment support frames, and retaining structures.

This guide is not intended to supersede contracts between the parties. If there are inconsistencies between the parties’ contracts and responsibilities defined in this guide, then the contracts between the parties govern the relationships and responsibilities. One use of this guide would be to evaluate the balance of the responsibilities associated with concrete rehabilitation.

1.3—Process

Concrete rehabilitation projects customarily begin with a condition assessment and evaluation of an existing structure, in whole or in part, seeking to establish whether an owner’s objectives can be met in consideration of constraints presented by the existing structure (**Stivaros 2019**). Rehabilitation construction may vary considerably from new concrete construction, potentially involving specialty professional services and unique construction techniques. In contrast to new concrete construction or maintenance, concrete repair and rehabilitation begins with a structural condition assessment. **ACI 562** contains performance-based requirements for assessment of existing concrete structures.

It is common for contractors to be engaged in advance of a rehabilitation program to provide access for surveys, assist in exploratory probes, execute material sampling and testing, and provide vital information to facilitate preliminary design analysis. Cost estimating, logistics, planning, and scheduling are essential aspects needed to define program parameters and assist an owner in confirming the project feasibility and program parameters.

Concrete rehabilitation projects often require parties with specialization or expertise gained through education, experience, and training.  **Documents**
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rience, and successful completion of such work. Designs are often led by design professionals with structural engineering backgrounds. Specialty repair contractors customarily lead such projects, although they also commonly work under general contractors depending on the overall project complexion and breadth. Specialty subcontractors perform work such as scaffolding, shoring, hydrodemolition, and pneumatically applied repair material placement methods (shotcrete). The likelihood of encountering differing concealed conditions is common in rehabilitation programs, necessitating suitable allowances and contingencies built into project budgets and schedules.

Unsafe conditions may be discovered during the evaluation phase, necessitating action before construction commences. Any unsafe conditions will need to be addressed by the owner until appropriate repairs can be undertaken. Measures to address unsafe conditions may include the installation of temporary shoring, limitation of access to a structure, or other restrictions preventing access to the unsafe area.

ACI 562 defines how the present condition of the existing structure and the owner requirements determine assessment and rehabilitation requirements using the design-basis code. The design-basis code for an existing concrete structure may be one of the existing, current, or original building codes defined by the authority having jurisdiction. To comply with the owner's objectives, the option of using the current building code as the design-basis code is available. If a more resilient or durable design is required, considerations of hazards and durability requirements beyond the current code may need to be addressed.

CHAPTER 2—DEFINITIONS

Please refer to the latest version of ACI Concrete Terminology for a comprehensive list of definitions. Definitions provided herein complement that resource.

agency construction manager—person or entity who enters into a contract with the owner to manage a construction project, and is not at risk; generally does not act as a general contractor; therefore, they do not have any construction risk in the project.

assessment—process of investigating by systematically collecting information regarding the performance of an existing structure; evaluating the collected information to make informed decisions regarding the need for repair or rehabilitation findings as conclusions and reporting recommendations for the examined structural concrete work area (member, system, or structure).

basis of design—in rehabilitation projects, a summary of the assessment of the existing structure that delineates findings and recommendations for repair, strengthening, alterations, modifications, or a combination of these, to achieve the owner's desired program. Refer to ACI 562 for a complete listing of information customarily contained in the basis of design.

concrete material supplier—entity that produces concrete and delivers it to the project in a freshly mixed and unhardened state.

construction manager at risk—entity or person that enters a contract with the owner taking on the risk of performance. The construction manager at-risk may function as a general contractor, performing or hiring contractors or subcontractors, or both, who perform the work.

design/builder—person or entity that undertakes a combination of both design and construction for either an entire project or a significant portion of a project.

design service life (of an element of the rehabilitation work area)—period after installation of a repair or modification during which the performance satisfies owner's intended service life requirements, provided routinely maintained but without being subjected to an overload or extreme event.

external reinforcement—reinforcement systems installed outside the profile of a concrete member that relies upon means other than the common reinforcement deformation interlocking with the concrete or direct compression of post-tensioned reinforcement anchorage on the existing concrete.

functionality—ability to provide capacity that meets or exceeds occupancy and use requirements, acceptable service, and acceptable aesthetics.

general contractor—person or entity identified as such in the agreement and is referred to throughout the contract documents as if singular in number.

prime contractor—person or entity that has a contract directly with the owner for a discrete portion of the work but is not a general contractor; this definition applies only when there is more than one entity with such a contract.

rehabilitation—repair or modification of an existing structure to a desired functional condition.

specialty contractor—person or entity—that is, contractor or subcontractor—whose scope of work includes the design and construction of a portion of the project.

specialty engineer—licensed design professional frequently retained by a contractor or specialty subcontractor to design a delegated portion of the project, such as shoring, falsework, and to delineate construction sequencing.

standard of care—level of attention, precision, expertise, and competence ordinarily expected of and demonstrated by professionals of the same discipline practicing in the same locale and faced with the same or similar facts and circumstances.

subcontractor—person or entity—that is, contractor—whose scope of work includes the construction but not the design of a contractually defined portion of the project.

testing/inspection agency—entity retained to perform tests or inspections, including special inspections as required by the contract documents, and applicable laws and regulations.

CHAPTER 3—CONTRACTS

The responsibilities of parties involved in a concrete rehabilitation project are customarily delineated in a contract, whether in the form of proposals, agreements, purchase orders, or other documents signed by the parties. The signed contract also defines the relationship and obligations between the signers and defines or binds together the

multiple documents that define the construction contract documents. The construction contract documents typically include contracting forms, project forms, conditions of the contract, specifications, drawings, revisions, clarifications, and modifications. Key elements in the agreement form are date, identification of the parties (owner, licensed design professional [LDP], and contractor or construction manager), a statement of the work or scope, a statement of consideration or construction price, a statement of completion or schedule, and signatures of the parties.

As a legal document, the parties should consult with their legal counsel in completing an agreement. It is important that the agreement used is appropriate for or matches with the type and complexity of the work that is proposed. To assist the parties in selecting the agreement, several organizations offer standard form agreements that should also be completed with advice from their attorney. Standard form agreements have been developed with specific adaptations for the range of work that might be required. For example, small projects can select abbreviated documents that avoid the lengthy and complex documents required for multi-year, multi-contractor, or mega projects. A family of standard form agreements can also offer options that specifically address the project delivery, basis of payment, and single or multiple prime contractors. For example, in rehabilitation projects, the agreement and forms can also include provisions for unit prices, allowances, and other details, such as when conditions below the concrete surfaces may not be known until the contractor starts the repair process and opens the concrete. Options are also available for design-bid-build with a single contractor or a construction manager, as well as options for a design-build approach (Fig. 3). Owners and public agencies may also have their standard form agreements that have been developed for their facilities.

Many organizations and agencies have produced common standard form agreements, some of which specifically address the special provisions needed or requested by their members. The leading providers of standard form agreements commonly used in the concrete repair industry include:

- (a) American Institute of Architects (AIA) Contract Documents—<https://www.aiacontracts.org/>

- (b) Engineers Joint Contract Documents Committee (EJCDC) Documents®: A joint venture of the American Council of Engineering Companies (ACEC), the National Society of Professional Engineers/Professional Engineers in Private Practice (NSPE/PEPP), and the American Society of Civil Engineers—Construction Institute (ASCE-CI)—<https://www.ejcdc.org/>
- (c) ConsensusDocs: By organizations in the architecture, engineering, and construction (A/E/C) industry—<https://www.consensusdocs.org/about/>
- (d) Design-Build Institute of America (DBIA) Contract Documents—<https://dbia.org/contracts/>

An agreement (standard form or specialty) delineates the parties' responsibilities and is ideally fair in the provisions among the parties. For consistency in application and coordination between the various related but separately contracted parties (that is, owner – design professional, and owner – contractor), agreements from the same agency and family are typically recommended.

Standard form agreements include a comprehensive list of project criteria in addition to defining specific responsibilities of the parties, including:

- (a) Contract sum, unit prices, and allowances
- (b) Project schedule, including critical milestones, dates of commencement, and substantial completion
- (c) Payment terms, approvals, and retainage
- (d) Dispute provisions
- (e) Owner rights and responsibilities, including project funding; obligation for agency approvals, permitting; obligation for providing information on the existing building, site, and design professional services deliverables
- (f) Contractor and subcontractor responsibilities, including but not limited to management and supervision of work, control of the site, and safety obligations; obligations to review existing field conditions and to notify the design professional of variances and unanticipated field conditions; and contract closeout and warranties
- (g) Communication protocols, submittals and information processing, and approvals

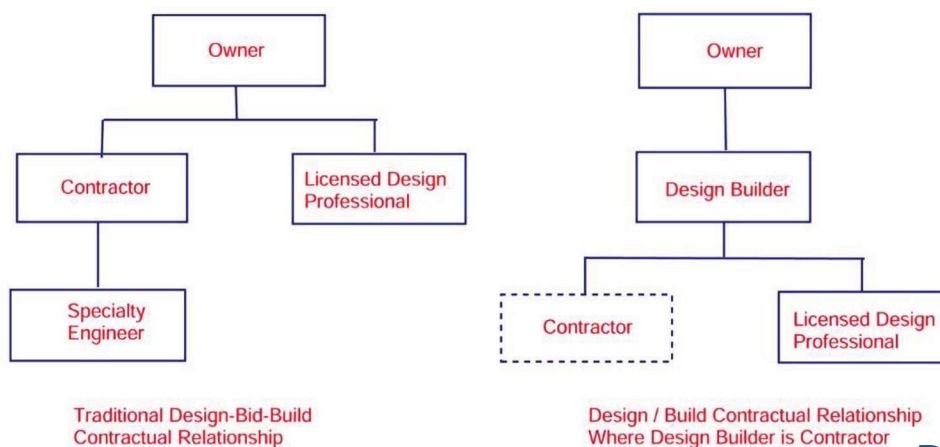


Fig. 3—Design-build options.

