Guide for Concrete Inspection

Reported by ACI Committee 311

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This guide discusses the need for inspection of concrete construction and other related activities, the types of inspection activities involved, and the responsibilities of various individuals and organizations involved in these activities. Field and laboratory testing activities are also considered part of inspection. This guide presents recommendations for inspection plan content and a detailed checklist of inspection attributes that can be adopted for use depending on the scope and needs of individual projects.

Keywords: concrete; construction; inspection; quality assurance; quality control; testing.

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CHAPTER 1—INTRODUCTION

1.1—Scope

This document is primarily intended for guidance in the development of inspection and testing plans that are part of the overall system designed to ensure quality in the finished concrete product. ACI Committee 311 recommends that the owner develop a quality plan, as outlined in ACI 121R, and

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that 311.4R be used to develop inspection and testing plans by those organizations assigned by the owner's quality plan to conduct inspections.

1.2—Philosophy

Inspection and testing requirements typically vary, based on the specific scope and needs of construction, and should therefore be tailored to each project individually. The content of an inspection plan is dependent on the type and complexity of the project, special features involved, quality level desired, building code requirements, and the responsibilities of the inspection organization performing the work. Any of these may necessitate the addition of more detailed inspection than conventional or may warrant a reduction from conventional requirements.

1.3—General

Inspection is simply a subsystem of the quality plan. It may be employed by the owner to evaluate future acceptance of the work or by contractors and material producers for quality-control purposes. In addition, inspection may be part of a program of activities performed by government agencies charged with enforcing building codes and other government regulations. The inspection process does not add quality to inspected items. Inspection simply establishes the status of inspected items relative to specified requirements. The information derived from inspections and tests, however, when properly evaluated, and with conclusions and decisions implemented, can result in the improvement of the quality of the product or process. The specified quality is achieved only by implementation of an adequate quality plan. Such a plan affects the entire project, from planning through design and construction to acceptance by the owner. Quality of work during the construction phase is achieved almost entirely by the contractor or producer's quality-control program. This quality-control program involves everyone from management to field supervisors to workers. Quality assurance and quality control should have strong, active support from top management and the active concern and participation of everyone involved in the construction process. Inspection and testing are only a part, though a very important part, of both quality-assurance and quality-control programs.

1.4—Definitions

1.4.1 *Quality assurance (QA)*—A management tool for all planned and systematic actions necessary to ensure that the final product meets the requirements of the contract documents and standards of good practice for the work.

1.4.2 *Quality control (QC)*—Actions taken by a contractor or material producer to provide and document control over what is being done and what is being provided so that the applicable standards of good practice and the contract documents for the work are followed.

1.4.3 *Owner*—The individual or organization having financial and legal responsibility for construction of a project, as well as bearing the ultimate responsibility for the public health, welfare, and safety related to the project. The term "owner" includes those organizations or individuals acting as agents for the owner.

1.4.4 *Architect/engineer (A/E)*—The architect, engineer, architectural firm, engineering firm, or architectural and engineering firm issuing project drawings and specifications, administering the work under contract specifications and drawings, or both.

1.4.5 *Contractor*—The organization responsible for constructing a project according to the project specifications and design drawings. The contractor may also possess the responsibilities of the A/E in designing and building the project and contract execution.

1.4.6 *Construction manager or owner's representative*—The person or management organization responsible to the owner for coordination and review of all contracted work. The person's or organization's role is to coordinate and communicate the entire scope of work to achieve a more efficient construction process.

1.4.7 *Inspection organization*—The organization, agency, or testing laboratory that is responsible for providing inspection and testing for the owner or for providing quality-control inspection and testing for the contractor or producer.

1.4.8 *Inspection*—Visual observations, measurements, and field and laboratory testing of activities, components, and materials to specified requirements along with the recording and evaluation of such data.

1.4.9 *Inspection/test report*—A document that records the results of observations, measurements, and tests as verified by the initials or signature of the individual responsible for the inspection/test activity.

1.4.10 *Material manufacturer or supplier*—The organization responsible for producing or manufacturing a product or material used in the process of construction, or for supplying products or materials to a project, with or without performing additional operations on the product or material.

1.5—Categories of inspection

Inspection activities generally fall into one of the categories described in 1.5.1 through 1.5.4.

1.5.1 *Owner's inspection*—Inspections and tests conducted by or for the owner either by the owner's in-house inspection group or by an independent inspection agency. Owner inspection is a part of the external quality assurance program conducted by the owner. Results of these inspections form the basis of the owner's decision to ultimately accept the work performed by the contractor. Owner-inspection programs should be structured so as to provide the owner with an acceptable degree of assurance that the work of the contractor is in conformance with the contract documents.

1.5.2 *Quality-control inspection: contractor*—A series of formalized activities and procedures that are part of the contractor's operation, providing in-process evaluation of the quality of construction. These activities help to assure the contractor that the finished construction will meet all requirements of the project plans, drawings, and specifications, and will be accepted by the owner.

1.5.3 *Quality-control inspection: producer*—A series of formalized activities and procedures that are part of the