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QUALITY ASSURANCE AND QUALITY CONTROL

Building owners want to be sure that they are getting what they pay for in terms of the quality of the building's construction. Quality assurance programs and quality control procedures are used toward that end.

Quality is defined by the International Organization for Standardization (ISO) as the "totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs." In most construction projects, the particular standard of quality that will apply in a given case is established by and measured in terms of the contract document requirements. The owner initially establishes a general standard of quality, which is then developed by the architect/engineer into specific terms and incorporated into the contract documents. The standard of quality required on a given project will vary depending on the needs of the owner, the project type, and the established schedule and budget.

What is the difference between the terms *quality assurance* and *quality control?* ASTM defines quality assurance as "all planned and systematic actions necessary to provide adequate confidence that an item or a facility will perform satisfactorily in service" and quality control as "those quality assurance actions which provide a means to control and measure the characteristics of an item, process, or facility to established requirements." In specification language, to assure means "to give confidence to," and to ensure means "to make certain in a way that eliminates the possibility of error." Quality assurance in construction could therefore be considered as the A/E's administrative process for *as*suring that the work will conform to the standard of quality established by the contract documents, and quality control as the procedures for testing, inspecting, checking, and verifying to *en*sure that the work meets the required standard of quality established by the contract documents. The A/E can endeavor to "assure" quality, but the contractor alone has control over construction means, methods, techniques, sequences, and procedures, and therefore only the contractor can "control" quality.

17.1 STANDARD OF QUALITY

The American Institute of Architects (AIA) Document A201, *General Conditions of the Contract for Construction,* contains very broad quality assurance and quality control provisions. The general requirements in Division 1 of a project specification expand on these provisions, but are still written broadly enough to apply to the work of all the specification sections. Each technical section of Divisions 2 through 16 of the specifications includes the specific quality assurance and quality control measures that may be required for that particular section.

The AIA General Conditions establish very broadly that materials and equipment must be of "good quality and new"; that work must be free of defects not inherent in the quality required or permitted by the contract documents; and that the work must conform to requirements of the contract documents. More detailed requirements may be elaborated in supplementary conditions, and in the project specifications. The general requirements contained in Division 1 of the project specifications may include several sections that help define project quality standards. The general requirements also establish administrative and procedural requirements that are just as important in achieving the required project quality as the technical standards in Divisions 2 through 16.

A standard of quality may be established in different ways, depending on the method of specifying. *Descriptive specifications* identify exact properties of materials and methods of installation without using proprietary names. *Proprietary specifications* list specific products, materials, or manufacturers by brand name, model number, and other proprietary information. *Reference standard specifications* stipulate minimum quality standards for products, materials, and processes based on established industry standards. *Performance specifications* establish a standard of quality by describing required results, the criteria by which performance will be judged, and the method(s) by which it can be verified.

17.2 QUALITY ASSURANCE PROGRAM

The MSJC Code and Specifications require that the specifier designate Level 1, Level 2, or Level 3 Quality Assurance as appropriate to the project type and function (*see Fig. 17-1*).

AIA Document A201 requires that the A/E "endeavor to guard the Owner against defects and deficiencies in the Work." The A/E does not have "control" of the work, and therefore cannot "control" quality. But the A/E can attempt to "assure" that the specified standard of quality is attained by developing and implementing a quality assurance program. A quality assurance program includes establishing

- Administrative procedures, rights, and responsibilities
- Required submittals, inspections, and tests
- Methods for resolving non-conforming conditions
- Required records

17.2.1 Quality Assurance Requirements in Building Codes

The *International Building Code* and the *MSJC Building Code Requirements for Masonry Structures* both contain specific mandated requirements for quality assurance. Both are based on type of facility and defined risk categories. The IBC and MSJC requirements are similar, but use slightly different terminology. The MSJC requirements are tabulated in *Figs. 17-1* and *17-2.* Level 2