# Risk Control Bulletin
## Construction Quality — A Model Program

RISK CONTROL

APSP
The Association of Pool & Spa Professionals®

The aim of a quality control program is to prevent construction defects and to ensure the performance and durability of the constructed product.

There is not a one-size-fits-all program. The program must be customized to the unique organization taking into account its: size and complexity, organization, operations, culture, exposure to liability, potential for damages resulting from climate, moisture, and soil conditions.

Contractors can not rely exclusively on the local building inspector as a measure of acceptability. An effective quality program, like any other business program, must include a number of key components. Although easier said than done, the keys to quality construction are the use of consistent and qualified labor and materials, and verification of product quality against a known standard. For these components to be implemented effectively, management must be committed and take responsibility for quality. To reduce the risk of liability associated with construction quality, your quality related activities need to be documented. The 5 key components of the quality program can be listed as follows and are described in greater detail below:

- Management Responsibility
- Material Selection
- Workmanship
- Inspection
- Documentation

**Management Responsibility for Quality**

- **Written Policy** – The quality policy should be a brief statement which clearly describes the company's commitment to quality. It should be signed by the senior executive and any quality manager.

- **Quality Plan** – A quality plan provides needed quality controls of the construction process and includes all relevant management, training, subcontractor agreements, material purchase agreements and specifications, inspection procedures, and worker qualifications.

- **Assignment of Responsibilities** to craftsmen, crew supervisors, purchasing agents, quality manager. Some examples of assigned responsibilities are:

  All employees have the responsibility to:

  - Stop work that affects the condition in question until any unsatisfactory conditions are corrected.
  - Stop work that affects the condition in question if the work would cover up any defects.
  - Report all quality or safety concerns to the supervisor.

  Craftsman are responsible for:

  - Performing only work for which they are qualified.
  - Using only approved materials, material use specifications, and procedures.
  - Using materials and equipment which are not defective.

  The Crew Supervisor is responsible to ensure that:

  - Each job meets the contract requirements.
  - The work complies with any applicable use instructions, codes, and regulations.
  - A qualified craftsman is available to the job site when work is performed.
    Only approved materials and equipment are used.
  - Job site inspections are performed and any non-conformances are corrected.

The Purchasing Manager is responsible to ensure that:

- All purchasing contracts for materials, equipment and services comply with the requirements of the quality program.

**Material Selection**

In most cases, since the selection of materials affects quality of the completed product, its fitness for the intended purpose must be verified. The assessment of materials' fitness must consider:

- Building code requirements
- Design specifications
- Demonstrated product performance capabilities and limitations
- UL approved or FM listed materials
- Compatibility of product systems

Materials must be inspected and stored properly, and any defects observed must be reported to the supplier promptly. A record of approved materials should be maintained and updated as needed.

**Workmanship**

To ensure proper installation and construction of approved materials, skilled, trained, and informed workers must be employed. In addition, every job should have a designated crew supervisor to perform inspections and oversee operations. Selection of workers should be based in part on their demonstration of key skill requirements. Following are some of the key components to ensure quality workmanship:

- Communication of quality program and their responsibilities for quality.

  Training of craftsmen should include:

  - Quality program responsibilities
  - Use of approved materials
  - Design requirements
  - Installation requirements
  - Work instructions
  - Material storage requirements
  - Job readiness requirements
  - Equipment and tools
  - Inspection procedures
  - Marking of any non-conformances
  - Trade contract requirements
  - Any product specific training

- Review and approval of workers by crew supervisor.

Trade contractor assessments should evaluate the capability of the trade contractor to:

Perform the specific types of work

- Complete job inspections
- Use qualified craftsmen
- Yield quality results
- Listed as an approved contractor by the product manufacturer

**Job Site Inspection**

Jobsite Inspection is a critical component to ensure quality construction materials and installation methods are being used at each stage of the construction process. Inspections detect any defects so that corrective action can be taken. Inspection forms are part of the inspection process and must be customized to the specific type of job and operation. Inspections are done by a qualified crew supervisor who must be available at critical job stages. Inspections are performed prior to start to determine readiness conditions during the construction process, and following the completion of the job. Below are more details of the purpose of each of these inspections.

- Readiness Inspection
  - Adequacy of work performed by previous trades that may affect installation quality
  - Building details are compatible with installation requirements
  - No adverse conditions that may impact quality
  - Available installation instructions
  - Only approved materials are available for use

- Job site is suitable for work to begin

- Process Inspection
  - Crew supervisor inspections at each phase of construction as needed by quality plan
  - Inspection forms available
  - Verify use of specific tools and equipment where quality is affected
  - Any non-conformances, including materials, manufacturers' specifications, work instructions, and trade contracts are reported to management for correction

- Completion Inspection
  - Verify that construction requirements of trade contracts have been met
  - Provide record of any non-conformance
  - Actual measurements are made where dimensional specifications are available
  - Records are maintained
  - Verify that installation instruction needed for next phase is available

**Documentation**

To help protect against liability and to verify that key activities of the quality program have been completed, documentation is needed. Below are some of the items which should be documented and recorded.

- Materials approved and used
- Readiness, process, and completion inspections
- Resolution of non-conformances
- Training
- Approved trade contractors
- Trade contracts
- List of qualified craftsmen

**Sample Quality Policy**

Our company shall operate with an effective quality program that ensures the performance and durability of products we construct, and prevents construction defects. Our quality program applies throughout our company to all employees and work activities that affect quality. To this end, we are committed to:

- Use materials and equipment that are capable of performing
- Ensure that work is performed by qualified craftsmen
- Assign clear quality responsibilities in our contracts
- Ensure that job site inspections are done properly and documented
- Comply with any manufacturer specifications
- Comply with any building codes and regulations
- Follow any procedures contained in our quality manual

Senior Executive Signature

_____Date_____

Quality Manager Signature

_____Date_____

**Quality Plan Design Considerations**

A quality plan should define the necessary quality controls and take into account possible defects, frequency and severity, performance and durability, and the effect on final product quality.

Update the quality plan when a product or process is changed, or when the process is unstable or not capable of producing reliable results.

The plan should include the following elements:

- Work instructions
- Approved materials
- Equipment and tools
- Inspector qualification
- Craftsman qualification
- Trade contractor qualification
- Material storage
- Inspection procedures
- Marking of non-conformances
- Posting of instructions for others

**Trade Contracts**

To provide a basis for an agreement between the general contractor and the subcontractor, the trade contract should clearly describe the work to be performed and the respective responsibilities of the trade contractor.

The following should normally be included in a trade contract:

- Job site location
- Dates of contract
- Product or system installed
- Responsibility for pre and post quality related activities
- Method of releasing work to start
- Specifications and conditions to be ready to start