

THE ROLE OF THE ARCHITECT AS COMMUNICATOR AND COLLABORATOR ON CERAMIC TILE PROJECTS

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ABSTRACT

Ceramic tile assemblies are unlike many other building assemblies due to their specialized nature and rapidly advancing materials, technologies, and construction requirements. Therefore, the Architect's role as communicator and collaborator is challenging and critical in the tile design and construction process. Throughout the course of project delivery, the Architect relies greatly on manufacturers, standard-writing bodies, and labor organizations for successful tile projects.

In traditional project delivery, the Architect has a contractual obligation to the Owner to provide the best quality tile installation within budget. The Architect executes this duty in two general phases: Preconstruction and Construction. This paper will explore the role of the Architect as communicator and collaborator, and how the Architect fulfills this role to deliver Quality Assurance (QA) in the Preconstruction phase and Quality Control (QC) in the Construction phase of a ceramic tile project.

1. PRECONSTRUCTION

1.1. CONSTRUCTION DOCUMENTS

The construction documents (CDs) consist of drawings and specifications. The drawings are quantitative. They show the exact dimensions of the room to be tiled, and they will often have schedules that assign certain tile to certain rooms or spaces. The drawings also address any special conditions that require graphic communication, such as transitions and terminations of tile finishes, which should be detailed in the drawings. The specifications are qualitative. They define the characteristics or the type of tile to be used. Specifications can be either prescriptive or performance-based. Generally, tile specifications are written as prescriptive. In other words, the specification describes the physical properties, manufacturer, or other criteria desired by the Architect. An example of a prescriptive specification is "Daltile Brancacci Series, 12-in. x 24-in., Ivory CR BC01." This type of prescriptive spec is a proprietary spec, since it specifies the tile manufacturer. An example of a nonproprietary prescriptive spec would be "Gauged porcelain tile meeting criteria in ANSI A137.3."

1.2. GENERAL NOTES, SCHEDULES, AND REFERENCES

We have said that the CDs must sufficiently communicate design intent to the Contractor. However, usually it is not feasible for the Architect to draw interior elevations of every tiled room, or to detail every special condition of the tile. Therefore, the Architect often uses general notes, schedules, and other methods of referencing standards in the construction documents. The use of referencing is an efficient way to ensure that up-to-date building codes and standards are met. Below is an example of a reference to TCNA and ANSI in the Tiling specification:

3.5 TILE INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

In conjunction with this paragraph, the project's Room Finish Schedule contained in the drawings indicates the type of tile, the setting material, the grout, and the TCNA method for installation. In other words, the detailed information contained in TCNA and ANSI is included in the contract via the reference to those standards. The use of referenced standards is a time-saving technique used by architects to minimize the information graphically delineated on the drawings and described in detail in the specifications. The use of references can be abused, however, if used too liberally or too generally. Architects are cautioned to limit the references to actual conditions on the project, and to tie the references directly to the project's individual conditions using notes or schedules on the drawings.

1.3. ADDRESSING LABOR REQUIREMENTS IN PRECONSTRUCTION

The selection of premium quality tile, setting materials, membranes, and grouts is important to the success of the project, as is the clear, concise, and complete communication of the installation requirements in the construction documents. However, good materials and good design are not enough to guarantee the success of a tile project. The fate of the project also relies on the skills of the installing contractor and the installers. Because the Architect has a contractual duty to the Owner to deliver a quality tile installation, the Architect should set forth in the specifications qualification requirements for the installing contractor and for the tile installers.

Tile industry organizations in the United States have made great strides in developing a unified set of qualification requirements for labor. With the input of IMI, International Union of Bricklayers and Allied Craftworkers (BAC), Tile Contractors Association of America (TCAA), and other industry organizations, the TCNA Handbook has cited Journeyman Tile Apprentice Programs, TCAA Trowel of Excellence certification, IMI Contractor College, and other select industry programs as recommended qualification criteria. MasterSpec, a company aligned with the American Institute of Architects (AIA), has similar language in the master guide specification they publish.

In 2015, the list of qualification criteria was amended to include the Advanced Certifications for Tile Installers (ACT Certifications), an industry-wide program that measures the skills of installers in seven distinct skill areas: Large format tile; Membranes; Mud floors; Mud walls; Shower receptors; Gauged porcelain tiles and gauged porcelain tile slabs/panels; and Grouts. Architects are advised to require ACT-certified installers on projects with a concentration of work in one or more of these high-skill areas. For example, a high rise hotel project with many showers would be an excellent candidate for the Architect to write into the specifications language as follows:

Installer has successfully completed the Advanced Certifications for Tile Installers (ACT) certification for the installation of Showers (www.tilecertifications.com).

The ACT certifications attest to the skills of the individual tile installers, whereas contractor credentialing programs such as Trowel of Excellence certification of the TCAA, and Five Star certification of the National Tile Contractors Association (NTCA) attest to the skills and business practices of the employing contractors. Both sets of requirements are important.

1.3.1. EXAMPLE OF QUALIFIED LABOR REQUIREMENT IN CONSTRUCTION DOCUMENTS

Scenario 1: The Architect neglected to include the requirement for qualified labor in a school project with large format thin gauged porcelain tile floors, and the project was awarded to the contractor with the lowest bid. To save money, the Contractor did not use a self-leveler on the floors, but instead used medium bed mortar as a leveling device to correct the floor flatness. The Contractor also did not use a lippage control system in order to save on cost. Result: The tile installation exhibited unacceptable lippage, and the bond eventually failed due to improper floor preparation techniques.

Scenario 2: The Architect's specifications required a TCAA Trowel of Excellence certified contractor who employed installers ACT-certified in Gauged Porcelain Tile. Result: Non-qualified contractors were not considered, and the project was awarded to a contractor who used experienced, certified installers who used industry-approved and manufacturer-approved work methods. The Owner was pleased with the project.

1.4. CONTINUING EDUCATION

Among the many practices the Architect can employ in Preconstruction to deliver maximum quality to the Owner, one of the most important is to stay informed of the latest developments in building codes, standards, and best practices in design and construction. The tile industry has seen rapidly changing technology with the advent of larger, thinner tiles, new technologies in setting materials and grouts, and the implementation of new training and certification programs in the labor sector to certify installers in these rapidly changing technologies. The standards to which we educate architects in the U.S. include the International Building Code, ANSI A108, ANSI A137, Tile Council of North America Handbook, MasterSpec, and the Advanced Certifications for Tile Installers.

With this goal of education in mind, International Masonry Institute (IMI) is a perennial leader in the U.S. tile industry in organizing, developing, and delivering programs that educate the national design community in ceramic tile. In 2017, IMI spearheaded a national educational program delivered in eight U.S. cities. Each city hosted a half-day program for local architects, designers, and contractors, imparting valuable information on new industry standards and best practices presented by product manufacturers and industry experts. By attending these programs, architects advanced their continuing education requirements mandated by state regulatory boards for architectural licensing.

1.5. PRECONSTRUCTION DUTIES, SUMMARIZED

Summarizing the Architect's quality management role in the Preconstruction phase of a tile project, the Architect is expected to be knowledgeable about tile materials, codes, and standards; he has a duty to the Owner to select tile in areas of the project where it will best serve the Owner; and he is responsible for developing the construction documents to a sufficient level of detail to communicate design intent to the Contractor. The Architect will also take measures to limit tile contractors bidding the work to only those who are trained, skilled, and qualified. These activities collectively define the requirements for quality in the Preconstruction phase, and therefore considered as provisions for Quality Assurance (QA). Because they establish the project's standard for quality, the QA measures performed by the Architect provide confidence that the quality requirements will be fulfilled in Construction.

2. CONSTRUCTION

Once the CDs are complete and the tile work is awarded to the tile contractor (Contractor), the project transitions into the Construction phase. The services provided by the Architect now take on the role of Quality Control (QC), which is defined as fulfilling and enforcing the pre-established requirements for quality set forth in the Preconstruction phase. During construction, the Architect observes the work and

oversees a variety of construction administration processes such as changes in work and contractor payment approvals.

2.1 CONSTRUCTION OBSERVATION

The primary role of the Architect in the Construction phase is to review the tile work in progress and to check it for conformity with design intent. Speaking to the importance of communication, if the Architect has developed the construction documents to a high level of completeness, precision, and consistency, it is unlikely that major issues will arise in construction. However, if important information in the construction documents is unclear, contradictory, or incomplete, the Architect is called to make clarifications and interpret design intent that should have been clearly addressed. With today's fast-track design schedules, unfortunately the latter is often the case, and the Architect must serve as an impartial arbiter between the Owner and the Contractor. Following are a few examples that illustrate CDs not fulfilling their requirement to convey design intent, and the measures taken to resolve the issues.

2.2 EXAMPLES OF CONSTRUCTION ISSUES AND RESOLUTIONS

2.2.1 WALL BASE EXAMPLE

The construction documents adequately describe the wall tile and the floor tile in the toilet rooms, but they do not address the wall base condition. The Contractor wants to provide a square base because it is the least expensive solution. The Owner prefers a cove base because it looks nicer and is easier to clean and maintain. Solution: The Architect directs the change to a cove base and authorizes an increase in the tile contract.

2.2.2 MATERIAL SUBSTITUTION EXAMPLE

The project has come in over budget, so the Owner directs the Architect to query the Contractor on value engineering measures. Solution: The Contractor offers to substitute the 12-in. x 24-in. rectified porcelain tile with a less expensive calibrated tile of the same size at a substantial cost savings. The Owner agrees to accept the inferior tile, and the Architect approves the change and credits the cost savings to the Owner. (It should be noted that "value engineering" is not the same as "cost savings." Often value engineering adds to the initial cost, but provides more value to the owner over the life cycle of the project.)

2.2.3 EXPANSION JOINT EXAMPLE

The construction drawings did not show any expansion joints (EJs) in the exterior elevation of a 100-ft. long tile wall, but the specifications made a reference to the TCNA Handbook method EJ 171, which requires a minimum spacing of 12 feet on center for EJs in an exterior wall. The Contractor needs clarification on where to place the EJs. Solution: The Contractor requests clarification from the Architect, and the Architect issues a sketch showing the exact locations of the EJs. No change to the contract amount is authorized.

2.2.2 FLOOR PREPARATION EXAMPLE

The Tiling specifications clearly refer to the ANSI A108 requirements for a concrete subfloor that varies by no more than 1/8 in. in 10 feet from the required plane of flatness to receive large format tile. Before beginning work, the Contractor

determines that the concrete does not meet the flatness requirement, and must be patched before he can place tile. There is no provision in the CDs for floor preparation. The Owner is reluctant to spend extra money and requests that the Contractor tile the floor as-is, without floor preparation. Solution: The Architect is aware of potential performance issues in the tile assembly if it were to be installed over an unsuitable substrate, and convinces the Owner to agree to a negotiated unit price for floor preparation, increasing the amount of the contract.

7. CONCLUSION

Due to the unique specialized nature of ceramic tile assemblies, the role of the Architect as communicator and collaborator is critical throughout the design and construction processes. For the use of tile to continue to thrive, all facets of the tile industry must continue to work closely together to deliver information and to support the Architect in quality management of tile projects.