Structural Practices

practical knowledge beyond the textbook

Concrete Specifications Education

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There appear to be two schools of thought on cast-in-place concrete specifications. The first school likes to separate the cast-in-place concrete into three separate master specification sections; 031000 – Concrete Forming and Accessories, 032000 – Concrete Reinforcing, and 033000 – Cast-in-Place Concrete. The second school likes to keep the entire section together (as distributed by many master specification libraries) named 033000 – Cast-in-Place Concrete. Both schools have the ability to produce clear, correct, concise, and complete specifications. Both schools could benefit from some additional educational opportunities as summarized by the following two hypothetical educational courses.

Concrete Specifications 101

As the course number implies, this course covers the basics of concrete specifying:

1) What version of MasterFormat (or another guideline) is to be used?
2) Is the project attempting to attain LEED certification?
3) What is the format for the specifications?
4) Is the terminology consistent between the specifications and the drawings?

Will the project be written to conform to the 2010 version of MasterFormat, or the 1995 version? MasterFormat, produced by the Construction Specifications Institute, is the numbering system used in the construction industry to organize specifications, cost estimating documents, product data, and even architectural libraries. An easy way to tell the difference between the two versions is by the length of the section number: the 2010 version uses six digits, while the 1995 version used only five.

Is LEED a factor in the scope of the project? LEED, Leadership in Energy and Environmental Design, is a process of certifying a project to varying levels of environmental friendliness. The rating system was developed by the U.S. Green Building Council. The process not only affects the drawings, but also the specifications. If it is determined that the project will attempt to obtain one of the levels of LEED certification, asking for and using the LEED scorecard during the development of the specifications is important.

Like drawings, specifications also need to follow a specific format. Format items to be requested and incorporated into a specification include, but are not limited to font, header and footer requirements, margins, and watermarks (if any).

Consistent terminology is required for a well coordinated set of documents. The specifications will call out a vapor retarder. However, many times, a more proprietary term will show up on the drawings. For example, instead of the term vapor retarder, the term Stego Wrap™ may be used. The use of proprietary terminology on the drawings does not easily allow for other manufacturers to bid on a project. Changing the term to its non-proprietary version allows the specifications to determine the manufacturers that will be allowed to bid. If help is needed for a correct non-proprietary term, contact the project's architectural specifier.

Concrete Specifications 201

This course covers advanced cast-in-place concrete specifying, including topics on editing manufacturer lists, below grade vapor retarders, floor and slab treatments, liquid floor treatments, and concrete finishing.

One of the often overlooked, but easy editing tasks is to edit the list of manufacturers for every product included in the specifications. Many structural engineers leave the entire list as it was distributed in master specification in the project specification. It is well known that if there are seventeen different manufacturers listed for a curing and sealing compound that not all manufacturers' products will have an equal quality level. It is up to the structural engineer to select the products. If there is truly no manufacturer preference, only that the product complies with the indicated ASTM standards, then delete the entire list of manufacturers.

The days of throwing a sheet of visqueen below the rebar prior to a concrete pour are over. Below grade vapor retarders have become more sophisticated. The floor finishes installed over concrete slabs on grade have become less tolerable of moisture migration through the concrete slab. As a result, the structural engineer and the architect need to coordinate not only what vapor retarder is being used, but where it is being specified. Some architectural specifiers have moved to specifying the below grade vapor retarders in the Division 7 sections with the waterproofing, damp proofing, or air barrier products in an effort to have single responsibility for the building envelope moisture control. Since many manufacturers produce vapor retarders, waterproofing, and air barriers, architects like to have one manufacturer for all of these products because of transition details and compatibility issues. As a result, structural engineers need to verify whether or not the vapor retarder will be included in the cast-in-place concrete section and what type of vapor retarder is required, especially if there is a specific product required.

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Many structural engineers leave floor and slab treatments in the cast-in-place concrete specifications. Many architects don't even know what these product entail, let alone require them on their projects. Floor and slab treatments include slip-resistive emery aggregate finish, slip-resistive aluminum granule finish, metallic dry-shake floor hardener, pigmented and unpigmented mineral dry-shake floor hardener. In this instance, it is better to take the floor and slab treatments out of the specification. There are projects requiring some of these products, but the majority of projects do not. Regardless of whether or not the floor and slab treatments are required in a project, the question needs to be asked of the architect. In addition, if none are required, be sure to delete the products out of Part 2 and the installation out of Part 3.

Similar to floor and slab treatments, many times all of the liquid floor treatment products are kept in a section. These products are used more frequently than the floor and slab treatments, but not frequently enough to err on the side of leaving them in the specification. More often than not, the structural engineer should err on the side of automatically removing the products and adding them back in if truly required. The penetrating liquid floor treatment product included in the master specification section is intended to be a hardener and densifier for high traffic floors (think warehouses and distribution facilities). However, when architects say they want a clear concrete floor sealer, they usually mean a second coat of curing and sealing compound, not a true concrete floor sealer. Liquid floor treatment products also include treatment for polished concrete floor surfaces. Polished concrete flooring for the most part is still in the kindergarten phase. The products included in the cast-in-place concrete floor system are not for the architecturally finished polished concrete flooring system. They are geared more toward the warehouses and distribution centers. Architectural polished concrete floor systems are covered in a separate section that will include the densifiers, the penetrating sealer, and sheen of the finish, and the amount of the aggregate to be exposed. Again, if a polished concrete flooring system is desired, verify with the architect whether it is to be specified in the cast-in-place concrete section.

Concrete finishing expectations of the architect always requires coordination. Architects always want the best finish, but the budget rarely allows it. Out of all of the finishes that can be left in the cast-in-place concrete section for formed surfaces, the one most frequently kept is the smooth rubbed finish. Floor slab finish expectations also need to be coordinated with the architect, especially in regards to floor flatness and floor levelness. Verify whether the architect wants to pay the contractor to form a flat floor, or if cement based hydraulic underlayment will be specified to achieve the desired floor flatness and levelness if tighter tolerances are required for a specific project. If there is a specific finish required for a project, confirm whether a mockup is required for the finish. As budgets are being cut and architects are adapting to the change by accepting concrete as it is cast, more architects are requiring mockups for the cast-in-place concrete for review and verification of the accepted finishes during the construction period.

The two cast-in-place concrete specification courses mentioned above have the ability to improve the caliber of the cast-in-place concrete specifications for a project. Better specifications can translate into fewer requests for information and a smoother running project.▪