

ARCHITECTURAL CAST-IN-PLACE CONCRETE —

Is It Worth the Trouble? by Reginald D. Hough, FAIA

Architectural cast-in-place concrete is an ideal product for the construction industry since it addresses all of the design and construction issues in a single process. With one operation, a fireproofed structure with the final architectural finish can be achieved.

Consequently, cast-in-place architectural concrete has taken a meaningful place in the building process, although not in the New York metropolitan area.

This and future articles will discuss why architectural cast-in-place concrete is often successful and will suggest ways to make this versatile material more widely used here.

All architectural concrete is exposed, but not all exposed concrete is architectural. Concrete surfaces that are exposed to view but are primarily utilitarian in function are not considered to be architectural. For example, parking garages, roadway ramps, bridges, and secondary industrial and service buildings usually use exposed non-architectural

concrete, which is performed with conventional formwork and placing procedures and involves little enhancement.

Architectural concrete, on the other hand, has both a utilitarian and a visual function and is used in highly visible architectural locations. It has a distinctive character and feeling in its own right, and is competitive in cost, function, and as a visual material with stone and similar materials.

To be cost effective and achieve the desired level of quality, these two categories of cast-in-place concrete — architectural and exposed non-architectural — must be approached differently during both design and construction.

Architects must properly differentiate between the levels of quality required on a project so that contractors can bid and prepare for construction correctly. Traditionally, concrete contractors are in the business of producing a very economical product on a very fast schedule, which is well suited to structural work that is not

highly visible. High end, sophisticated work needs more intensive scrutiny.

Contractors need to understand that a change in planning approach, construction methods, and techniques are required to perform higher quality architectural work than they normally produce. They may need to purchase equipment that will perform at a high level of presentation. If these conditions are observed, the quality of the finished presentation will most likely be enhanced.

Achieving a Successful Result

The traditional method of specifying and detailing work is for designers to describe the final product in performance documents but not to be involved with the means and methods of producing the work. Normally, design professionals get involved in how a product is manufactured only when very special one-of-a-kind items are part of the work.

Concrete is not generally per-

(continued on page 16)



(far left)
Air Traffic Control
Tower, JFK
International Airport,
New York, NY.

(left)
The Grand Louvre
Museum, Paris,
France.

*Architect for both
projects: Pei Cobb
Freed & Partners*

ceived to be a special product because it is used all the time in construction.

The industry normally accepts materials by approving samples. Final acceptance is contingent upon a comparison of the product to the approved samples. In cast-in-place architectural concrete, small samples seldom represent more than an approximation of the basic color of the material. They do not indicate how the formwork and placing will affect the presentation. Therefore, interim acceptance of formwork and placing procedures, as well as full size mock-up samples, must be made in order to effect true control of the product.

Cast-in-place architectural concrete work, more than any other material, depends on the on-site construction effort. Other materials are either manufactured in a plant or performed on-site under a specific standard for achieving product quality. In both cases, the effort is highly controlled to assure consistency of the surface and a high-quality

product.

Cast-in-place concrete, on the other hand, is manufactured at the site in its final position using raw constituent materials and few specific standards for performance. In addition, many separate firms come together to perform the work, and all must be coordinated into a singular quality effort. This manufacturing process is highly vulnerable to error unless rigidly planned, supervised, and controlled.

Planning Results in Quality

Anywhere architectural concrete is used - but particularly in New York City which builds faster under more diverse conditions than anywhere else - a definite plan to control quality of surface presentation is imperative. Critical steps in the plan include:

- Reorienting the people who will carry out planning, purchasing and field tasks to ensure that they understand the tasks required for the desired result.
- Reviewing the manufacturing methods which will be used to

produce the concrete.

- Producing meaningful mockup panels to simulate actual construction conditions.
- Adopting a knowledgeable approach to the review of the quality of the concrete.

Is Architectural Cast-in-Place Concrete Worth the Trouble?

Absolutely. It is an ideal product on functional and economic grounds, and it can compete with almost any other material as a visual addition to our communities. ■

About the Author: *Reginald D. Hough, FAIA, is an architect, engineer and concrete consultant. For ACI Committee 303 – Architectural Concrete, he is sub-chairman for updating the "Guide to Cast-in-Place Architectural Concrete." He was inducted into the AIA College of Fellows for his work in advancing concrete as an architectural material.*

(right)
Jacob K. Javits Convention & Exposition Center, New York, NY, Pei Cobb Freed & Partners, Architects.

