

Status of the CIB's Proposed Changes to Concrete Sections of the NYC Building Code

by Jerry Parnes, Chairman,
CIB Code Committee

Nothing of true historical significance takes place easily. After almost a year of review, deliberations, revisions and more revisions, we are closer to finalizing the proposed changes to the concrete-related sections of the New York City Building Code that will satisfy today's concrete requirements. As previously described by Casimir Bognacki (CIB code revision committee member and Manager of the Materials Engineering Division for the Port Authority of NY & NJ) in the CIB June 2000 *Bulletin*, the significant recommended changes involve:

- Giving concrete producers the responsibility to provide mix designs, Quality Control testing, and inspections at the batch plant;
- Eliminating Table 10-3, minimum cement requirements, and tying design mix proportioning directly to ACI 318-99;
- Emphasizing durability criteria;
- Encouraging the use of environmentally-friendly fly ash, slag and silica fume as a substitution for portions of cement.

In order to get feedback on these proposals, the CIB Code Revision Committee held meetings with various organizations including the Association of NYC Concrete Producers, the Structural Engineers Association of New York (SEAoNY), and a

recently-established Concrete Testing Laboratories Group. Feedback has been mostly positive and encouraging. However, as with any significant changes, some fine-tuning is needed. We are presently holding additional meetings with the testing laboratories and concrete producers to clarify and satisfy concerns in regard to the proper amount and defined responsibilities of testing at the batch plant and site, design mix responsibility, and means of checks and balances to insure all work is being done properly.

Prior to Local Law 65, which was passed in 1990, few requirements were clear in regard to testing labs at the batch plant and job site. The pre-1990 law stated that licensed concrete testing laboratories were required to perform all tests. Concrete producers were responsible for mix designs, and the Architect/Engineer designated for controlled inspection was responsible for accepting all mixes and test results. Minimum cement contents were required with no allowable reduction for admixtures.

In 1990, the CIB endorsed the following changes which were then put into law:

- Testing laboratories were required to have a licensed professional in responsible charge.
- The substitution of approved admixtures permitted an 8% reduction of cement;
- Testing laboratories were made responsible for design mix preparation and Quality Assurance and Quality

Control at the batch plant and project site.

- The Architect/Engineer designated for controlled inspection was responsible for accepting all results.

As evidenced by feedback from many agencies and consultants, these revisions have not worked perfectly. The current proposed code revisions must address the deficiencies, be a document that all the related entities within our industry can feel comfortable with, and place New York City in the forefront of concrete production. A more detailed status of the present proposed code changes with several of the items to be resolved, prepared by Casimir Bognacki, follows:

SUMMARY OF NYC BUILDING CODE CHANGES PROPOSED BY THE CIB

- Mix designs must be provided by the concrete batch plant. The batch plant hires a licensed testing laboratory to verify that the materials being used with the proposed mix design will produce the desired concrete properties of strength and/or durability as required by contract.
- The code requires a mix to comply with ACI 318 when exposed to chloride ions, sulfates or a freeze thaw environment.
- Chloride ion content in new concrete should be tested for conformance to ACI-222.

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○ Testing of concrete at a batch plant is the producer's responsibility and defined as Quality Control (QC) Testing. Quality Acceptance Testing is a responsibility of the owner, who hires ACI certified technicians to perform the required acceptance tests (cement weight, percent air and water in the mix, etc.) on site. The means of verifying the concrete producers' QA/QC is under discussion.

○ Eliminate – Method I – Proportioning with Minimum Cement Contents. This method provided high minimum cement factors for concrete with a required compression strength between 3000-5000psi that have become a NYC standard. Unfortunately, these high cement factors cannot guarantee the required strength. Many other factors affect concrete strength.

High minimum cement factors produce mix designs that are costly, less durable and environmentally unfriendly. Mix designs must be developed and reviewed in accordance with ACI-318, which allows mixes to be submitted based on laboratory or field verification.

○ The new code encourages the use of pozzolans such as flyash and granulated blast furnace slag (GBFS) in concrete in order to make concrete more environmentally friendly, reduce costs and produce concrete that is less permeable to chloride ions. It is recommended that, when flyash and/or GBFS are used, 56-day strengths be specified, providing loading conditions will allow.

○ Testing concrete delivered on site for water content is recommended as part of Quality Acceptance (QA) testing

requirements on site.

○ The code will set high standards for licensed testing laboratories and concrete producers. Laboratories will be required to be certified by AASHTO for the concrete and aggregate tests they perform in their laboratories. Concrete producers will require a designated batch plant quality control manager who must have a minimum of ACI Grade I Field and Laboratory Certification.

○ It is recommended that only certified technicians perform tests in the field and laboratory. Technicians must be certified by ACI or NICET. (Laboratory technician certification is now mandated by ASTM- C-1077 Standard Practice for Laboratory Testing Concrete & Aggregates for use in Construction). ■

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