

Gus Sirakis

From: Bhol, Saroj [sbhol@panynj.gov]
Sent: Monday, November 27, 2006 9:32 AM
To: Gus Sirakis
Cc: Fatma Amer; Bognacki, Casimir; Groark, Thomas; Lin, C. John; Lombardi, Frank; Passeri, Carl; Sandiford, Raymond; Zipf, Peter
Subject: FW: WTC Redevelopment Projects-Concrete Test and Inspection Procedure
Follow Up Flag: Follow up
Flag Status: Completed
Attachments: DOC061116cas1.pdf

Gus,

Here's the response to your questions in the order asked .

- 1.The sampling frequency is given in the attachment.
- 2.ASTM C-31 -03 allows the use of 4x8 cylinders for strength testing providing the EOR is in agreement.
- 3.Inspections at batch plants will be performed on an as needed basis ,when we need to verify materials being used at a plant.

Our specification is " end result", that is we test for all critical parameters .This requires more testing than required by code.

- 4.We follow ACI 318 section 5.3.

Thanks
Saroj

-----Original Message-----

From: Gus Sirakis [mailto:ConstadinoS@buildings.nyc.gov]
Sent: Saturday, November 11, 2006 4:12 PM
To: Bhol, Saroj; Fatma Amer
Subject: RE: WTC Redevelopment Projects-Concrete Test and Inspection Procedure

Saroj,

With regards to your e-mail below, I have the following comments & questions:

1. Could you please provide more information on the sampling rate? We are interested in how large are the "Lot sizes" and how many samples are taken for testing. Also, what types of tests are being performed? In addition, have you used the procedure you are proposing for testing in the past?
2. ACI 318-02 Section 5.6.3.2 references ASTM C31-98 "Making and Curing Concrete Test Specimens in the Field". ASTM C31-98 Section 5.1, note 4 does not recommend the use of cylinders smaller than 6 inches in diameter for acceptance testing for specified strength (ASTM C31-98 has been superseded with ASTM C31-06, I will find out if this requirement has changed). Do you have previous test information to share that will provide more information?
3. How often are the periodic inspections? Do you require any plant certifications?
4. Can you please clarify the procedure to be used? Are you going to be using a method such as the one outlined in ACI 318 Section 5.3?

Please feel free to contact me if you have any questions or concerns.

Thank you,

5/3/2007

Gus Sirakis

From: Bhol, Saroj [mailto:sbhol@panynj.gov]

Sent: Thursday, October 26, 2006 4:14 PM

To: Fatma Amer

Cc: Gus Sirakis; Bognacki, Casimir; Groark, Thomas; Lin, C. John; Lombardi, Frank; Zipf, Peter

Subject: WTC Redevelopment Projects-Concrete Test and Inspection Procedure

Fatma,

On some of the WTC Redevelopment projects, such as the Freedom Tower, Memorial, Transportation Hub, etc., Port Authority will be supervising the construction by itself. For proper quality control of concrete work on these projects, Port Authority's Materials Division will perform the concrete tests as well as the controlled inspections. We would like to utilize the procedures outlined below, which are utilized for projects in our other facilities and produce excellent results:

1. For frequency of testing, use lot sizes of concrete instead of sampling and testing of concrete every 50 cubic yards of concrete, as specified in the Building Code. A lot of concrete is defined as the production of a single work period. There may be instances where lot sizes will be greater than 50 cubic yards of concrete per test, particularly for mass pours of several hundred cubic yards of concrete material.
2. Use 4-inch diameter by 8-inch high cylinders for compressive strength testing, instead of 6 inches in diameter by 12 inches in height. Based on tests by our Materials Division, there is very good correlation between this cylinder size and the coarse aggregates sizes being used at the WTC site. In addition, ACI does allow the use of 4x8 cylinders
3. Inspect the batch plant periodically and check that the actual material components used in mix designs for work at the WTC are actually physically at the plant, and randomly sample some of the constituents, as necessary, during production. Other than that, our experience is that there is very little that can be verified at the plant.
4. Based on extensive research by Port Authority's Materials Division, the minimum cement factors specified in the NYC Building Code Tables 10-3 are excessive, uneconomical, and have an adverse effect on the durability of the concrete in terms of shrinkage cracking due to high paste volumes. We plan to base our mix proportions on trial mix test results and/or mixes successfully used within the two preceding years.

Please let me know if the Department of Buildings has any issue with this procedure.

Thanks

Saroj

- (2) Follow manufacturer's recommendations for agitation during application and warming where necessary during cold weather. Do not use liquid membrane forming curing compound where the surface being cured is to receive a finish that will be bonded to the concrete surface or where a floor hardener is to be applied, unless a certification of compatibility and a minimum five year performance record is submitted in advance to the Engineer for approval.
- (3) The Engineer will check for uniformity through random sampling and testing. Testing may include determination of membrane infrared spectrum, pH, specific gravity and solids content.

3.05 QUALITY ASSURANCE TESTING, SAMPLING, AND INSPECTIONS

- A. Quality Assurance testing during mixing and placing of concrete will be performed on samples taken from the end of the pump line or at the point of discharge in accordance with ASTM C 172. The Engineer will take samples of concrete from each Lot during a single Work period based on random sampling procedures contained in ASTM D 3665. A Lot of concrete is defined as the production of a single Work period. For each Sublot, cylinders will be made in accordance with ASTM C 31 when testing for compressive strength, as well as 4x8 cylinders when permeability is being tested and beams when flexural strength is being tested. The cylinders and beams will be tested in accordance with ASTM C 39 and ASTM C 78 respectively for each Sublot to determine the compressive strength and flexural strength at the time requirements specified.

TABLE 1
LOTS AND SUBLOTS

<u>Daily Placement Quantity (Cubic Yards)</u>	<u>Number of Lots</u>	<u>Number of Sublots</u>
Less than 50	Note 1	Notes 1 and 3
50 – 100	1	3 equally divided
101 – 450	1	4 equally divided
Greater than 450	1	Note 2

Table 1 Notes:

1. If a given Class of concrete has one Work period's placement less than 50 cubic yards, it will not constitute a Lot. It will be added either to the previous or the next Work period's Lot, whichever is closer in time, or until a minimum of 3 Sublots are completed constituting a Lot.
2. For concrete placements of 450 cubic yards or greater, a Sublot will be deemed to be one fourth of a Lot of concrete, or 150 cubic yards of concrete, whichever is less. For larger pours the Engineer may increase the number of cubic yards that constitute a Sublot.
3. If the total concrete quantity under the Contract for any type of mix is less than 50 cubic yards, it will constitute one Lot and will be divided into a minimum of 3 Sublots, regardless of the placement schedule.