

A two-year delay on the construction of the third set of locks of the Panama Canal is largely due to problems with concrete mix as well as reinforcing steel design. As the Panama Canal Authority (ACP) wanted locks that would basically always be functioning, this meant that all systems required back-ups and all the concrete had to be of the highest quality in order to meet the ACP requirements.

Workers put forward all their efforts in order to pour the last concrete for roads, curbs and draining system with the locks scheduled to be opened on June 26th. Once opened, ships carrying 14,000 containers will have the ability to transit the canal.



Image source: australiancruisingnews.com

The initial large delay came to light because the basalt rock that was available to make aggregate had generated a lot more fine aggregates than anticipated. The first cornerstone of the project was to pour 5 million cubic meters of concrete as well as installing 250,000 tons of rebar. ACP further required the use of an independent test lab to measure deviations in the concrete cores. This was completed by Fall Line Testing & Inspection firm. “We use ASTM C1202 (Electrical Indication of Concrete’s ability to Resist Chloride Ion Penetration), one of the standard methods to measure concrete’s ability to resist chloride ion penetration”, stated Tim Counts - a long-time employee of Fall Line Testing & Inspection.

It is worth noting that Giatec Scientific also has a device called the [Perma](#) for measuring concrete’s ability to resist chloride ion penetration (ASTM C1202, AASHTO T277), estimation of chloride diffusion coefficient of concrete and estimation of chloride penetration coefficient of concrete!

Jan Kop, project coordinator explains that marine concrete that is in contact with salt water has to hold up for a hundred years. In order to ensure the success of such concrete one must prevent the penetration of salt water that will subsequently corrode the rebar. In their first

attempts however, the marine concrete for this project did not pass ACP's interpretation of the ASTM C1202 after 90 days of curing. "This inflexibility caused considerable delays" she exclaimed.

It just goes to show how important concrete testing devices are in the durability and strength assessment of concrete structures!

Source:

http://www.theconcreteproducer.com/how-to/concrete-production/panama-canal-concrete-solutions_0