

Aerospace Training Building Is Well Grounded with MAPEI

The British Columbia Institute of Technology (BCIT) is expanding its campus to include a new aerospace technology building, where it will train workers in aircraft maintenance, airport maintenance, engineering, and flight operations. Construction on the 80,000-square-foot hangar began in late 2005. All of the concrete work was performed by R-Four Contractors, Ltd., of Langley, British Columbia, including tilt-up and cast-in-place concrete.

The first 20,000-square-foot pour of the 12-inch-thick concrete floor was found to contain an excessive fly-ash content (28%), which resulted in delamination of 50% of the surface area. R-Four immediately adjusted the concrete composition to solve the problem, and the remaining 60,000 square feet of floor was poured without incident. Charlie Salji, the project manager, then addressed the problem of the delaminated concrete and found that his concrete accessories supplier and MAPEI were ready to help him come up with the ideal solution.

One alternative was to jack-hammer out the damaged area; however, that would have taken months of time, ruined the piping buried in the concrete, and skyrocketed the construction costs. The better option was to patch the 10,000 square feet of delaminated concrete, but there were a number of challenges to overcome. Salji needed to put down a surface that was as thin as possible while still remaining structurally sound. In addition, a vapor appeared to be percolating through the thick slab, causing hollow spots. Finally, the patch needed to be power-trowelled to match the surface of the surrounding concrete.

Salji turned to Glenn Best of Richform Construction Supply for suggestions. Best discussed the situation with MAPEI Representative Dave Randall, and they made an on-site visit to the BCIT aerospace building. After evaluating the slab, Randall recommended MAPEI's *Mapecem 102*, a one-component, fast-setting mortar often used for the renovation and topping of interior/exterior horizontal concrete surfaces. With an impressive compressive strength of 20,7 MPa (3,000 psi) in 4 hours and 34,5 MPa (5,000 psi) in 24 hours, *Mapecem 102* was a good choice for the power troweling Salji intended to do. By combining *Mapecem 102* with the most suitable binder, R-Four could alleviate the costs and environmental impact of the removal process, as well as saving a significant amount of time.

The most important question that needed to be answered was which product would give the best bond. Best and Randall brought a variety of MAPEI binders to the site and worked with Salji to test different combinations on 1200-square-foot test patches. Because the power troweling of the *Mapecem 102* caused strong reverberations through the ¼-inch screed, the concrete contractor

needed a superior binder, and MAPEI's *Planibond EBA* epoxy bonding agent met all his requirements. Randall and Best were able to complete the test patch, including the power troweling within 4 ½ hours. When the *Mapecem 102* was burnished by the power troweling to match the surrounding cement, it became so densified that repeated pounding with a hammer did not affect the surface. "I believe this is the first power-trowelled patch we have ever made," said Best. "We believe we have come up with a unique solution for patching such a large heavy-wear surface. *Mapecem 102* and *Planibond EBA* gave us everything we needed to help R-Four solve their problem."

With Glenn Best's help, Salji's team patched the few small, 2- to 3-inch hollow spots in the patch by injecting a very fluid epoxy through two holes that were drilled into each of these spaces. "We've come to expect the great service we always get from Richform," said Salji. In a separate area, MAPEI's *Planigrout 755* construction grout was used under the tilt-up panels (walls) after they were all erected and the roof was put on. The panels were placed onto shims when they were first erected so that they could be positioned perfectly level and plumb. As a standard practice, the gap under the panels that is created because of the shims is filled with construction grout.

The hands-on attention Richform Construction Supply and MAPEI gave their customer really made the difference for the concrete contractor and the BCIT Aerospace Technology Campus. The building is opening the first week of August, 2007, right on schedule.