

How to: Renovation of taxiways

08.03.2024 / Deutschland

Civil engineering/ Infrastructure



When you renovate taxiways, you need flawless organisation that leaves nothing to chance. And a lot of experience. PORR Verkehrswegebau GmbH shows how it's done.

By the time the first plane arrives early in the morning, we are already gone. And with us, all construction machinery. Then it's almost as if we had never been there. But only almost. What can already be seen is a refurbished taxiway. This is because the heavily used asphalt surfaces of airport runways are usually repaired at night. Outside of flight operations. This places stringent demands on personnel planning and construction logistics in

terms of tightly synchronised deployment times and work in the safety area. But we have a lot of experience of this. Recently we successfully completed refurbishments at two airports – Germany's largest in terms of passenger volume in Frankfurt and the fourth-largest in Düsseldorf. The in-house building materials laboratory and our subsidiary CMG Baulogistik supported us in this endeavour.

Frankfurt: M for Mike

The connecting routes between the runways and the terminals are named according to the NATO phonetic alphabet. This enables pilots to get their bearings better. And so there is also a taxiway M for Mike in Frankfurt. In a section between the intersecting taxiways M8 and M10, we refurbished Mike's heavily used and damaged surface. First of all, we had to mill the securely attached surface – 42,800m² in total – to a depth of 3 to 12cm and then lay a 20,700m² Stress Alleviating Membrane Interlayer (SAMI), a 1,500m² asphalt base course, 15,840m² of asphalt binder, and a 26,300m² asphalt concrete top layer. In a second construction phase, we renewed the two taxiways L5 and M8 using a hybrid construction method – concrete on asphalt. Here, too, we had to mill off the damaged surface to

a depth of between 4 and 32cm over an area of 24,760m² and build a new asphalt structure consisting of a 15,000m² SAMI, 9,700m² of asphalt binder, an 18,500m² asphalt concrete top layer, and a 2,800m² concrete surface. We also laid 250m of cable conduits and installed new sign foundations. The particular challenge here was that we were only allowed to work at night between the closing time of 10:30 pm and 6:30 am. In the morning, everything had disappeared again. We were not allowed to leave anything to chance when it came to deployment planning and construction logistics for the use of equipment, but also for the delivery and removal of materials and demolition. Meeting deadlines and close coordination with third-party trades were particularly important.

Night-time runway renovation

Düsseldorf: Q for Querwind

The former Querwind (meaning crosswind) runway takes its name from its original purpose: it enabled pilots to avoid strong crosswinds. At 1,300m, it is relatively short. This is why the crosswind railway is now in operation as TWY K5 and TWY L9 and is in need of renovation after more than 50 years. We carried out the work in four construction phases starting in February – sections 1 and 3a in day shifts, sections 2 and 3b in night shifts. Our contract included milling off the damaged asphalt layer to a depth of 20cm over an area of 40,000m², breaking up 14,000m³ of concrete pavement, demolishing 1,000m³ of slotted channel and foundations, reconditioning 15,000m³ of concrete, removing 62,000m² of topsoil, and excavating 20,000m³ of

soil. We then laid 13,500m³ of soil material, 14,000m³ of recycled material, 5,700m³ of ballast base course, and 29,000m² of hydraulically bound base course, as well as 13,000m² of asphalt in the shoulder area and 29,000m² of asphalt in the taxiway area. We also constructed sign foundations and cable and drainage shafts, connected 580m of drainage pipes, laid 7,200m of cable protection pipes, and installed 720m of slot drainage channels. In order to maintain flight operations on the northern runway, we also had to renew sections of the out-of service taxiway K4. All taxiways are now freshly refurbished. Or as they say in the business: cleared for takeoff.