

Ready for Take-Off: HOBAS® and Schiphol Airport CC-GRP Pipes for Renovating Airport Drainage System, NL

Travelling by air is one of the safest, most accurate and fastest ways to travel. This reputation, however, makes high demands on air carriers as well as airports and one can easily deduce that these companies need to be equally demanding whenever they act as customers. Amsterdam Airport Schiphol is likewise known to be a critical client: a combination of high quality standards and short delivery times usually demands a great deal of contractors and suppliers. One may say that not every supplier comes into consideration to deliver to Schiphol.

HOBAS® CC-GRP Pipe Systems are being utilized at Schiphol Airport since 2003. The successful cooperation between HOBAS Benelux and Schiphol Airport led to an agreement in March 2008 to continue using HOBAS CC-GRP Pipes beneath the airport's airside.

Schiphol covers a total area of 2820 hectares, which is approximately 8 times the size of the Central Park in New York. With five runways and one small airstrip, the airside consists of 1.2 million m² asphalt and 3.8 million m² concrete. Stormwater is conveyed in 30 km culverts, 300 km stormwater sewers and 125 km concealed gutters – the complete drainage system totaling 455 km. Most of the reinforced concrete drainage underneath the airside's paving has been installed in the 1960s.

During the 1990s Schiphol Airport checked the condition of its old sewers. Video inspections showed cracks in the concrete pipe material. More examinations followed detecting the severest damages in areas that are most heavily frequented by arriving and departing planes. The traffic load condition was therefore reevaluated with the conclusion that the Boeing 747 is mainly responsible for the damages to the reinforced concrete pipes.

Renovation Plan

Due to this situation and bearing in mind that the airport will have to be able to cope with larger aircraft such as the new Airbus 380, Schiphol opted for a renovation plan based on new requirements. Static calculations were thus made using the aircraft class DAC 750 with a maximum weight of 750 tons. This class meets the requirements for the traffic loads of the latest generation of aircrafts.

The plan involved renovating all concrete pipes beneath the paved airfield. Heavily damaged pipes beneath runways and taxiways were prioritized and involved a variety of diameters ranging from 400 to 1500 mm at a total of 35 track crossings. Schiphol established a separate plan for each runway and taxiway for which the pipe section running directly under the airstrips were



kept as short as possible. Disruptions to air traffic should be minimized so that Schiphol opted for trenchless installation methods such as sliplining and jacking.

HOBAS® CC-GRP Pipes

For Schiphol Airport, HOBAS® produced GRP Pipes that withstand the exceptional traffic loads of current and future aircrafts. Their minimal nominal stiffness lies at 16000 N/m² and are fit to be installed directly beneath runways, taxiways and aprons.

3 types of HOBAS® CC-GRP Pipe Systems were employed for the project:

HOBAS® Relining Pipes were used for sliplining affected concrete culverts that cross the runways and taxiways and have a relatively small angular deflection. By inserting GRP pipes in the existing structure, the line withstands the full traffic loads and obtains the complete lifetime and amortization period of a new sewer. A crawler crane inserts the pipes into the given structure from a starting pit; no sliding devices were needed for this. The annular space between the old and new pipe was subsequently filled with grout to uniformly distribute the loads on the sliplined pipes. Masonry connections link the GRP Pipes to the concrete shafts.

HOBAS® Jacking Pipes were utilized where the pipe diameter had to be maintained and where opening a trench was not an option. After completion of the new line, which was installed on a different route, the existing pipe is filled with cellular concrete to avoid that it collapses.

HOBAS® SewerLine® Pipes were installed beneath all paved areas where an open trench was feasible but also on the open field.

A total of 7.3 km HOBAS GRP Pipes now contribute to the high safety standards at Schiphol airport - ready for take-off and landing of the Airbus 380.



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Year of Construction

2009

Total Length of Pipe

7.3 km

Diameter

DN 300 – 1600

Pressure Class

PN 1

Stiffness Class

SN 16000

Installation Method

Jacking, Sliplining, open trench

Application

SewerLine®

Client

Airport Schiphol, Amsterdam

Contractor

Various

Advantages

high stiffness and long lifetime, easy and fast installation, small reduction in diameter, smooth inner pipe surface, outstanding support by HOBAS Benelux.

