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# A45 Birmingham Airport

One of the most significant economic developments ever undertaken in Birmingham, Colas's £55m JV delivered both an extension of the airport's runway and ancillary works on a major, arterial route.

**Birmingham is one of the UK's busiest airports with more than 9 million passengers a year. But, with a runway of just 2,600m, it was not able to keep up with increasing long-haul demand. To compete with the likes of Manchester and Heathrow, and reach China, South America or the US west coast, the runway would have to be extended.**

## The Need

There were two main challenges: the airport needed to remain open and with housing close to the north end of the runway, the extension had to be in the south which meant diverting the A45.

## The Approach

The Colas JV team came up with a major on-site construction solution. A schedule was devised to minimise disruption to airport users and to traffic on the busy A45. The first phase saw the creation of a 2km section of dual carriageway to divert the A45. Once this opened, we could excavate the existing road to extend the runway - using 60,000m<sup>3</sup> of the excavated clay from the road works as structural fill.

With the additional runway and taxiways in place, we then resurfaced the whole runway to the same standard. Resurfacing work was carried out in tight overnight possession windows when the airport was not operating.

## Adhering to safety standards

Before any work could commence, we had to provide a full technical design for the solution to comply with international (ICAO) standards. Once on site, our UKAS accredited mobile laboratory conducted on-going testing to provide the client with assurance that the runway adhered to specified quality standards.



### Designing for the conditions

Surface quality and performance was crucial, so we engaged the Colas Campus for Science and Techniques (Colas SA's state of the art R&D facility in Paris) to design a solution to fit the local environment.

We opted for a grooved Marshall Asphalt for the main runway and an alternative, BBA (Béton Bitumeux Aéronautique) surface for the runway shoulders and taxi-ways. The macro-texture of the BBA offered excellent friction performance without grooving and enabled the rapid dispersal of rain water. We used a pavement design – based around a keel section in the centre of the runway, in the area of maximum loading. This meant we could reduce the structural thickness to 300mm across the width of the runway. The mix design produced a compressive strength in excess of 55MPa at 7 days.

We set up our own concrete batching and mobile asphalt plants on-site to avoid delays and to maintain consistency. In total, we laid some 289,926m<sup>2</sup> of asphalt surfacing plus 108,044m<sup>2</sup> of concrete pavement.



### Lighting the way

As part of the airport works, Colas installed new AGL lighting, altered the Public Safety Zones (PSZ)/Obstacle Limitation Surface and revised the Instrument Landing System. Colas also installed new AGL cable and fittings to the multiple lighting systems including high and low intensity runway edge and approach lighting.

Over 310 pre-cast concrete pits and 3,500m of ducts were installed within the airside environment to accommodate the new AGL circuit. A new sub-station was also constructed for the south pumping station and low voltage and communication cables fitted. In addition, a high voltage cable was fed from a new sub-station to TWC3 approximately 1,000m.



- > Total project value £55m
- > 470m extension of the airport's main runway
- > 2km dual carriageway of the A45 arterial route
- > 8km of new road construction
- > 289,926m<sup>2</sup> of asphalt surfacing plus 108,044m<sup>2</sup> of concrete pavement laid
- > 1 single contract to optimise efficiencies

### Covering every aspect

The project meant moving the airport boundary, so we also constructed a new perimeter road airside of the new boundary fence – including installing a new pit and duct system to support the all-important telecoms and fibre services.

We also installed new drainage networks on the runways and roads and diverted 2 brooks – relocating a large colony of English white clawed crayfish. At a third brook, we put pollution control measures in place.

### Creating real value

Our considerable experience of working at live airports proved invaluable, particularly during the resurfacing phase, which could only take place during tightly controlled night time possessions.

We ensured cost-efficiency and delivered savings by running the A45 works and the runway extension project as one construction contract.