

# AAPA 2017 QLD OUTSTANDING PROJECT AWARD WINNER



## BRISBANE AIRPORT CORPORATION RUNWAY OVERLAY

The Brisbane Airport Corporation 01/19 Runway Overlay project ran from March to October 2016.

Fulton Hogan Industries delivered the project on time and within budget. A fully compliant runway opened every morning at 5am. There were no lost time injuries and the job has been used as a benchmark for runway overlays internationally and at home.

Two teams of highly skilled, experienced construction staff were used: a night team and a day team.

### The project requirements were:

1. Laying about 42,000 tonnes of asphalt for the resurfacing of the central 1200m length of runway 01/19, as well as full resurfacing/reconstruction of the runway shoulders and blast protection pavement spanning about 3500m
2. Removing the existing electrical infrastructure (both the primary and secondary circuits, about 150km) for the full runway and installing a new electrical infrastructure
3. Removing and replacing all airfield lighting
4. Repairing concrete pavement on either end of the runway.

Line marking and runway grooving were required on the finished pavement surface. In order to ensure the works were compliant, grading works on the flanks were undertaken nightly.

### To minimise disruption to passengers and airport stakeholders, works were undertaken in two stages:

- Initially, works on the two ends of the runway were allowed to reduce its length, allowing works to be completed under live aircraft conditions. This meant that air traffic moved directly above the project teams throughout their shift. Working times during this stage were limited to 11pm to 5am, providing an immovable working window of five hours.

- Thereafter, all central works were undertaken during a full runway shutdown. During this period, the full runway was closed to all aircraft traffic from midnight to 5am. Although this removed the impact of live air traffic overhead, it reduced the working window to four hours. During this period, taxiways needed to remain operational, adding complexity because resources were required each shift when crossing the multiple live taxiways.

### Every shift required a comprehensive shift plan, that detailed:

- Each construction activity, sequenced on a minute by minute program, including relevant drawings
- Traffic plans for the runway and the fully operational perimeter road
- Vehicle staging plans
- Construction traffic routes
- Traffic management plans
- Laydown positions
- Positions of all airside safety officers utilised to monitor live taxiway crossing points
- Positions of all site security personal used to monitor federal aviation security requirements
- Contingency plans
- Emergency plans.

Asphalt works were confined to an average effective area of 45m x 80m per shift with 120 personnel and 64 major items of plant interacting on site at any given time. To manage this effectively, the project invested significant resources to ensure that exclusion zones particular to all plant were strictly adhered to. The project had no MTI, LTI or injuries for the full duration of the project, an outstanding safety result for an outstanding project.

Robust contingency planning was undertaken and every scenario was planned for.

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## **Innovation used in the delivery of the project included:**

Fulton Hogan offered the client a proprietary premium modified bitumen emulsion tack coat developed in response to the increasing risk of asphalt overlay delamination and slippage as higher tyre pressures and stresses from aircraft braking shear continually increase. JetBond™ was formulated to provide improved adhesion of the asphalt overlay and to resist softening during hot weather. It protects runway overlays from debonding and was developed with trafficability and rapid curing in mind. It reduced the risk of any foreign object debris (FOD) on the runway and acted as dust suppression on the flank works.

## **Project innovations:**

The accurate location of existing services posed a significant risk and the latest innovations in ground-penetrating radar to locate services and hydro excavations were used to minimise this risk.

Cutting slots within the existing infrastructure for the electrical works was required, and a large rock saw mounted to a bobcat was used which produced a neat excavated trench in which to lay conduit and cable.

## **AGL (Aeronautical ground lighting)**

A prefabricated plate on which the edge lights were preinstalled was used to enable rapid installation of edge lights each night following the asphalt overlay works.

## **Taxiway Hotel 3 full Reconstructions**

A Foam Bitumen base (FBB) and 150mm of A10E AC14 was used on pavement failure areas on the main runway that improved constructability of the pavement in the four-hour window.

## **Blast protection pavement improvement**

A crack seal application along the expansion joints followed by a K2P Prime on the concrete surface followed by an AC14 (C320) 50mm asphalt overlay was implemented on all sections of concrete blast pavement on the runway.

## **Traffic**

To eliminate confusion and prevent unauthorised entry, the team utilised green strobe lights placed on top of traffic cones at every entry point onto the runway.

## **FOD (foreign object debris) improvements**

Delineators were installed on the temporary pit cover plates, making them clearly visible and ensuring each was accounted for at the end of each shift.

## **On-pavement trenching works**

A cold applied emulsion treatment (EmulSeal) was used on secondary pavement excavations before the final overlay of asphalt.

## **Flanks**

Flexterra, a flexible growth medium, was introduced to replace turf on flanks, resulting in significant savings.

## **Communication**

Efficient, effective interaction between all stakeholders on this project was critical to its success. On a project of this size and complexity, everyone needs to be fully aware of all components of the works at all times.

## **Team meetings ensured good client, staff and stakeholder interaction:**

- Daily pre-meetings where technical, operational, safety and construction teams could discuss the planned works for the shift
- Daily joint pre-start meetings where detailed shift plans were presented to all project members in 30-minute presentations
- Daily close-out meetings with all managers after each shift
- Weekly aircraft operational meetings to discuss upcoming Notams (Notice to Airmen) requirements
- Weekly programming meetings
- Weekly quality meetings
- Weekly safety meetings
- Monthly management meetings.

Importantly, the whole project team, whether Fulton Hogan, BAC or any other stakeholders, were viewed as a single entity with a common goal. Open, clear, consistent communication was practised between all parties.