Milford Aerodrome Resurfacing, Fiordland

– working at a remote world heritage site

"The successful performance of the seal coat was made possible because of integrated design, management and operations."

The brief for the construction of Milford airport was very challenging and was a high risk project due to location, climatic conditions and constraints associated with working within an operational airport.

The airport is the gateway to the world heritage site of Milford Sound and the landscape and topography brings a unique set of challenges. It has the highest rainfall in New Zealand and the airport location at the head of a fiord, with tidal wash migrating under the runway, resulting in an extremely high water table.

CLIENT Ministry of Transport

CONSULTANT Opus International Consultants Ltd (Dunedin)

KEY STAKEHOLDER Department of Conservation

BLACKTOP

Analyse | Solve | Construct

BITUMEN & PAVEMENT

Research | Design | Analysis

DELTA BITUMEN

Source | Formulate | Supply

Milford Aerodrome resurfacing – a feat of engineering. New seal designed specifically for climatic conditions.

The airport is the second busiest airport in New Zealand during the summer period with a high number of flight movements per day. Regular services are offered by Aspiring Air (Wanaka), Glenorchy Air and Milford Sound Flightseeing (Queenstown). Milford Sound Helicopters are based at the airport.

The existing pavement within the hardstand area exhibited ponding of water and tourists alighting from planes had to step through puddles of water, which was not desirable for a tourist operation.

The airport could only be closed for two days for the main runway to be re-surfaced as operators would stand to lose up to $100,000 a day. Sealing for the carpark and taxiway hardstand had to be done while the airport was operational. Work on the runway could only be done between the hours of 5-9pm due to Department of Conservation accommodation being located adjacent to the runway.

Access to services	Nearest township – Te Anau 2 hours away.
Transportation	Heavy equipment needs to pass through Homer Tunnel – 600 metres wide and 4.2 metres in height.
Operational	Carpark taxiway and hard stand had to be sealed while airport was operational. Parking to be available at all times. (No secondary runway).
Environmental	Plant had to be pre-cleaned prior to set-up on site. Aggregates had to be imported from approved sources to ensure no seed movements. All vehicles and aggregate had to be washed down.
Construction timeframe	Climatic conditions meant this project had to be completed in February (peak summer tourism season).

The Department of Conservation also imposed strict conditions to protect the unique flora and fauna in the area, particularly to eliminate any possibility of seed movements. Road access to Milford Sound involved passing through the Homer tunnel. Plant items that were transported to site had to be removed off the transporters and driven through the tunnel then reloaded.

During construction, when working in proximity of the runway staff had to be in continuous radio contact with the airport control tower and in the case of any unscheduled flight arrival be prepared to evacuate.

The airport pavement seal was cracking (due to the bitumen oxidizing) and was due to fail, and there was a loss of waterproofing on the runway surface.

Opus International Consultants specified a design methodology for the re-surfacing, a three coat multi-coat design with multiple binders incorporating bitumen and emulsion.

A basecourse overlay was applied, levelled and compacted to the hardstand area to new levels and a new three coat multi-coat chipseal surfacing applied. The job had to be completed over a number of stages – 50% of the basecourse laid at a time and 50% of the sealing surface. The reconstruction programme had to allow for the hardstand area always to be available and parking had to be provided at all times for light aircraft. During construction planes were moving around the boundaries of all work areas.

While surfacing operations were taking place Blacktop also had to ensure a chip-free surface as any loose chips could possibly damage planes.

At the end of the job minor fencing and planting of native plants was completed to landscape the airport. The newly constructed pavement and new chipseal surface is performing well and proving to be a successful innovative solution suited to the local climate and geology.