

## RUNWAY CONDITION REPORT 18 MARCH 2019

The Norfolk Island Aerodrome runway is the subject of this report. The photographs and descriptions below are as of 4pm local time on the 18 March 2019.

As the Airport Manager I submit these photographs as evidence to the apron, taxiway and runway surface. The runway is still considered serviceable but is under extreme distress and the potential for a surface failure is considered likely. Council staff are mitigating the risk of failure on a daily basis and improved methods will be used in the near future when the rubber bitumen mix crack seal material for the new equipment arrives.

This report will be issued monthly.

### **Taxiway and Apron Area**

The taxiway and apron area in front of the terminal is in acute distress. The images numbered 1,2,3 below demonstrate the following:

### **Crocodile Cracking**

A series of interconnecting cracks caused by fatigue failure of the hot mixed asphalt (HMA) surface under repeated traffic loading is called alligator or crocodile cracking, as shown in figure 1,2,3. High tensile strains at the bottom of the asphalt layer under a wheel load initiate fatigue cracks. The crack propagates to the surface as a series of parallel cracks, which get interconnected with repeated loading. Alligator cracking, which is predominant in the wheel paths, is considered to be a major structural distress that can lead to structural failure of the pavement.



Image 1, above, apron bay



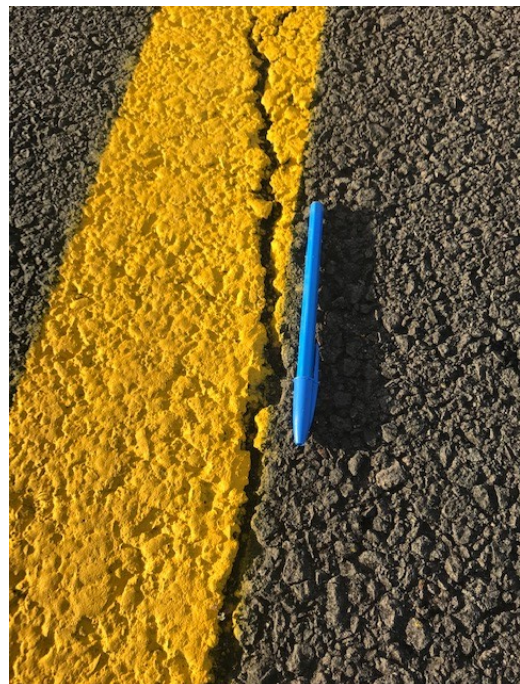
Image 2, right, taxiway





Image 3, left, apron bay

Longitudinal, transverse, and diagonal cracks divide the slab into two or three pieces and are generally caused by a combination of load repetitions, curling stresses, and shrinkage stresses. Medium- or high-severity cracks are usually working cracks and are considered major structural distresses.







These cracks represent a major problem and require constant monitoring. The Airport staff monitor these on a daily flight basis and address any issues as they occur

Rutting is a longitudinal surface depression in the wheel path. Pavement uplift may occur along the sides of the rut. Rutting is caused by the permanent deformation occurring in any of the pavement layers or subgrade, which is usually caused by consolidation or lateral movement of the materials due to traffic loads. Significant rutting can lead to major structural failure of the pavement. A rut depth of 25mm

is considered to indicate functional failure due to the ponding it can cause.

### **RUNWAY SURFACES**

Pumping is the ejection of material by water through joints or cracks caused by the deflection of the slab under moving loads. As water is ejected, it carries particles of gravel, sand, clay, or silt, resulting in loss of pavement support. Pumping near joints indicates poor joint sealer and loss of support that will lead to cracking under repeated loads. Pumping can occur at cracks as well as joints and is classified as a functional distress.

Wearing away of the pavement surface caused by dislodging of aggregate particles and loss of asphalt binder leads to raveling and weathering. It indicates significant hardening of the asphalt binder and can cause severe foreign object debris (FOD) problems and leads to functional failure.



Longitudinal cracking along the joints on the main runway

Anthony Allan  
**AIRPORT MANAGER, NORFOLK ISLAND AIRPORT**

22 March 2019