# INTISARI

Bandar Udara Internasional Aji Pangeran Tumenggung (APT) Pranoto Samarinda memiliki panjang *runway* 2.250 m dan lebar 45 m serta mampu melayani pesawat sekelas Boeing 737-900 ER. Sejak dibuka pada bulan Desember 2019, sering terjadi banjir di kawasan tersebut dikarenakan drainase yang kurang optimal. Air di permukaan perkerasan dapat masuk ke struktur perkerasan dan menyebabkan kerusakan di perkerasan. Hal ini terbukti dengan ditemukannya *rutting* sedalam kurang lebih 7 cm di posisi alur roda pesawat di sebelah kiri, tidak jauh dari *apron*. Air yang terjebak di struktur perkerasan harus segera dialirkan melalui *subdrain*.

Penelitian ini bertujuan menganalisis ketidaksesuaian sistem *subdrain* di Bandar Udara Internasional APT Pranoto Samarinda berdasarkan kriteria desain *Unified Facilities Criteria (UFC): Surface Drainage Design – U.S Department of Transportation - Federal Aviation Administration* dan *Federal Highway Administration.* Data sekunder yang diperoleh digunakan untuk menghitung rencana diameter saluran *edge subdrain* dan jarak antar outlet saluran *edge subdrain.* Hitungan untuk kebutuhan kapasitas saluran *edge subdrain* kemudian dibandingkan dengan kapasitas saluran *edge subdrain* minimal berdasarkan nomograf dalam buku Cedergren (1974).

Hasil analisis menemukan ketidaksesuaian di hilir outlet pipa kolektor *subdrain taxiway* di saluran induk yang tidak memenuhi syarat, yaitu minimal 6 in. (152 mm) di atas muka air banjir kala ulang 10 tahun. Selain itu, saluran di perkerasan *taxiway* menggunakan struktur *aggregate trench* yang tidak disarankan oleh FHWA (2002). Oleh karena itu, direncanakan saluran *edge subdrain* di *runway* dengan diameter 8 inch (20 cm) dan jarak antar outlet 90 m. Area *taxiway* dibagi menjadi dua bagian, yaitu *taxiway* B1 direncanakan dengan saluran *edge subdrain* diameter 10 inch (25 cm) dan jarak antar outlet 162,5 m serta *taxiway* B2 dengan diameter 6 inch (15 cm) dan jarak antar outlet 23 m. Area *apron* direncanakan saluran *edge subdrain* diameter 10 inch (25 cm) dengan jarak antar outlet 100 m. Selain itu, direncanakan pula lapisan drainase di *runway* dan *taxiway* setebal 4 inch (10 cm) dengan koefisien permeabilitas sebesar 30.000 ft/hari (0,106 m/det), sedangkan di area *apron* setebal 6 inch (15 cm) dengan koefisien permeabilitas sebesar 45.000 ft/hari (0,159 m/det).

**Kata Kunci :** Bandar udara, perkerasan, *rutting, subdrain,* lapisan drainase, saluran *edge subdrain.*

# ABSTRACT

Aji Pangeran Tumenggung International Airport (APT) Pranoto Samarinda which has a runway length of 2,250 m and a width of 45 m is capable of serving aircraft in the class of Boeing 737-900 ER. Since its opening in December 2019, floods have often occurred in the area due to suboptimal drainage. Water on the pavement surface could enter the pavement structure and cause damage to the pavement. This is evidenced by the discovery of a rutting of approximately 7 cm deep in the position of the plane's wheel groove on the left, not far from the apron. Water trapped in the pavement structure need to immediately channeled through the subdrain.

This study aims to analyze the mismatch of the subdrain system at APT Pranoto International Airport, Samarinda based on the design criteria for the Unified Facilities Criteria (UFC): Surface Drainage Design-U.S Department of Transportation-Federal Aviation Administration and Federal Highway Administration. Secondary data obtained are used to calculate the planned diameter of the subdrain edge channel and the distance between the outlet of the subdrain edge channel. The calculation for the required edge subdrain channel capacity is then compared with the minimum edge subdrain channel capacity based on the nomograph in Cedergren's book (1974).

The analysis results found a mismatch at the downstream outlet of the taxiway subdrain collector pipe in the main channel that does not meet the requirements, namely at least 6 in. (152 mm) above the flood water level on the 10 year return period. In addition, the channel on the taxiway pavement uses an aggregate trench structure which is not recommended by FHWA (2002). Therefore, a subdrain edge channel is planned on the runway with a diameter of 8 inches (20 cm) and a distance between outlets of 90 m. The taxiway area is divided into two parts, namely taxiway B1 planned with a subdrain edge channel with a diameter of 10 inches (25 cm) and a distance between outlets of 162.5 m; taxiway B2 with a diameter of 6 inches (15 cm) and a distance between outlets of 23 m. The apron area is planned for a 10 inch (25 cm) diameter subdrain edge channel with 100 m spacing between outlets. In addition, a drainage layer on the runway and taxiway is planned for a thickness of 4 inches (10 cm) with a permeability coefficient of 30,000 ft/day (0.106 m/s), while in the apron area a thickness of 6 inches (15 cm) with a permeability coefficient of 45,000 ft./day (0.159 m/sec).

**Keywords**: Airport, pavement, rutting, subdrain, drainage layer, edge subdrain channel.