

# Greening Industrial Estates in Singapore: Pasir Ris-Tampines Wafer-Fabrication Park

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## The Masterplan

In the recent announcement of its vision as a ‘City in Nature’, the National Parks Board (NParks) shared plans to utilise nature-based solutions as a key element in combating climate, ecological and social resilience issues. Industrial estates have traditionally been designed as isolated and independent developments from their landscape context resulting in a segregated environment. NParks has partnered with JTC Corporation to develop a landscape masterplan for Pasir Ris-Tampines Wafer-Fabrication industrial estate (PRTDPWF). The masterplan design intent is to create a new model for the industrial estate to be an integral part of its larger landscape context leading to the improvement of the quality of life for local residents and workers. NParks’ aim of activating and introducing multi-functional green spaces helps to break the negative perception of the industrial estate being mono-functional and a harsh environment.

Wafer-Fabrication industrial estates, wafer fabs in short, are semiconductor plants where devices such as integrated circuits and micro-circuits are fabricated. The nature of wafer fabs manufacturing results in domineering monolithic building footprints, which limits greenery optimisation as well as creating an unattractive and lifeless visitor experience. The wafer fab manufacturing process, at the same time causes a rise in the urban heat island and carbon emission further impacting visitor experience as well as the wider community.

Situated within two heartland zones, Pasir Ris and Tampines, the concept landscape masterplan of PRTDPWF emphasises nature-based solutions to enhance the resilience of the estate. With the abutting heartland zones including Sengkang, Punggol and Hougang, PRTDPWF is in a strategic position to have a wider positive impact ecologically



and recreationally on the north east region of Singapore (Figure 1).

The concept landscape masterplan identifies four key issues that address the rising awareness of climate, ecological and social resilience.

### 1. Fragmented Habitats

Multiple parklands and waterbodies surround PRTDPWF. With its massive urban industrial footprint, the wafer fabs disrupts the physical connection between the existing green and blue networks.

### 2. Urban Heat Island

Each of the monolithic wafer-fabs possesses a large surface area of concretised roofs resulting in a low albedo effect that increases surface temperature. Moreover, air-handling equipment on the roofs are emitting hot air, causing an increase in ambient temperature to its environment.