

## Overview

The Environmental Protection Department (EPD) in Hong Kong is responsible for implementing various environmental policies, including management of the operation of major waste treatment and disposal facilities and planning for new facilities to collect. The Refuse Transfer Station (RTS) plays a critical role in waste management, compacting and containerizing waste for transport to the West New Territories Landfill in Hong Kong. With a throughput of approximately 1,225 tons per day, RTS operates multiple advanced systems, including the Computerized Weighbridge System, Exhaust Ventilation System with Odor Removal Unit, Wastewater Treatment Plant, and Vehicle Wash System to ensure all refuse are processed according to local regulatory requirements before transferring to landfill.

**Customer Name:**
Environmental Protection Department & Apple Solutions

**Deployment Location:**
Chai Wan, Hong Kong

**Application:**
Waste Management Systems with IoT

**Products used:**
4x Altai A2
2x Altai AX600-S

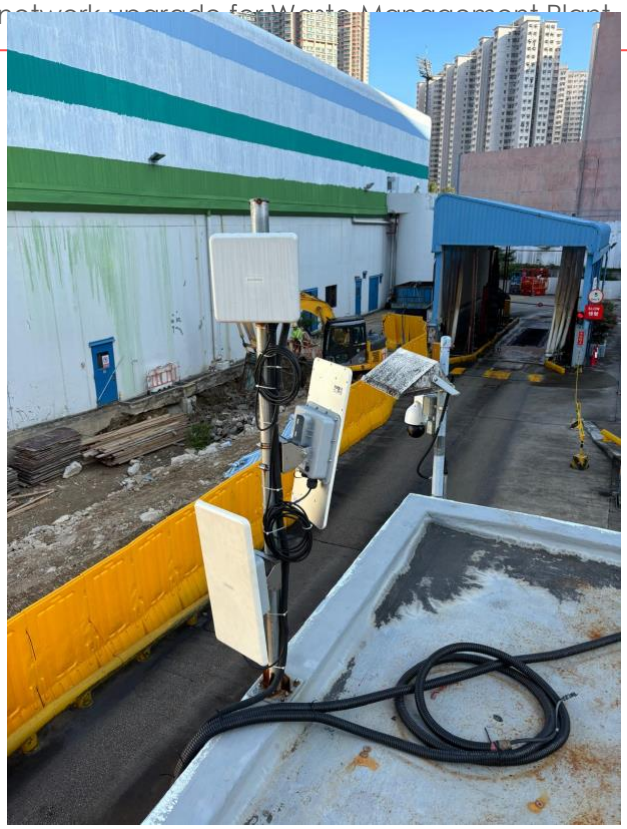
**Solution:**
- Super Dual-Band Coverage
- Hardened for Harsh Outdoor Conditions
- Dual-image and fail-safe boot

Benefits:
- Enhanced Connectivity
- Wi-Fi for IoT and Mobile Devices
- Increased Operational Efficiency
- Durability and Reliability

## Challenges

To keep up with the growing demands in waste management, the EPD has decided to upgrade the system at the RTS to ensure that all advanced systems are connected to the station server and monitored 24/7. Apple Solutions, a partner of Altai, conducted a site survey at the RTS and identified several challenges in upgrading the Wi-Fi networks. Reliable Wi-Fi coverage is essential for the operation of various systems; however, the Wi-Fi signal is often impeded by physical barriers such as machines and waste. Additionally, heavy machinery in the RTS generates electromagnetic noise that can interfere with wireless signals, particularly in the 2.4GHz band.

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The RTS also faces unique challenges due to its environment, which is saturated with moisture and contains various types of waste with unknown compositions. Therefore, the equipment used in the RTS must be robust, with enclosures designed to withstand corrosive substances found in household waste. Furthermore, the aging infrastructure, commissioned in November 1992, was built without consideration for Wi-Fi access points. This legacy wired network requires careful planning to ensure compatibility with new Wi-Fi networks while minimizing disruptions to ongoing operations.

Lastly, multiple waste management systems operate around the clock in the RTS, necessitating seamless integration and stable connections for mission-critical utilities. The new Wi-Fi network must be simple to deploy to minimize system downtime, ensuring that all processes run efficiently.



AX600-S



A2

## Implementation

During the planning phase, EPD and Apple Solutions conducted a thorough site survey to assess the specific requirements of the RTS. This survey involved evaluating the existing infrastructure, identifying potential obstacles for Wi-Fi coverage, and mapping out ideal locations for the Altai access points. The entire planning process took approximately two weeks, allowing for detailed discussions and adjustments based on the RTS's unique challenges.

To validate the Altai products' ability to withstand the humid and acidic conditions at the RTS, we perform a proof-of-concept to test the equipment in such harsh conditions. The user and Apple Solutions expressed their satisfaction with Altai's proven results in the POC.

The installation involved some upgrades to the existing cabling and switches for compatibility with the new Wi-Fi network. It was completed in approximately three days, scheduled during the evening and overnight to minimize disruption to ongoing waste management operations.

## Solution

The deployment of 6 units, including the Altai AX600-S for coverage and the A2 for bridging, ensures reliable connectivity across the large RTS facility. This configuration effectively overcomes physical barriers and enhances Wi-Fi access for operational systems, facilitating connectivity for IoT devices and mobile devices, which allows seamless communication with the control room/CMP.



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Furthermore, the equipment features an IP67-rated weatherproof enclosure, designed to withstand harsh environmental conditions. This durability is crucial given the RTS's exposure to waste and moisture, ensuring the longevity of the equipment. Additionally, the dual-image and fail-safe boot features minimize the risk of system failures caused by power issues, thereby enhancing reliability and reducing downtime, which is vital for continuous operations at the RTS.

## Results

The deployment of the Altai access points has significantly enhanced connectivity, facilitating seamless communication between critical systems and improving overall operational efficiency. The network also supports IoT devices and mobile devices, allowing for uninterrupted communication with the control room or centralized management platform.

This enhanced connectivity has minimized delays in data transfer, resulting in faster processing times across all systems, including the computerized weighbridge and wastewater treatment. Additionally, Altai's robust equipment has effectively withstood the challenging conditions of the RTS, ensuring continuous operation and minimal downtime.



*Image Source: Environmental Protection Department*



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