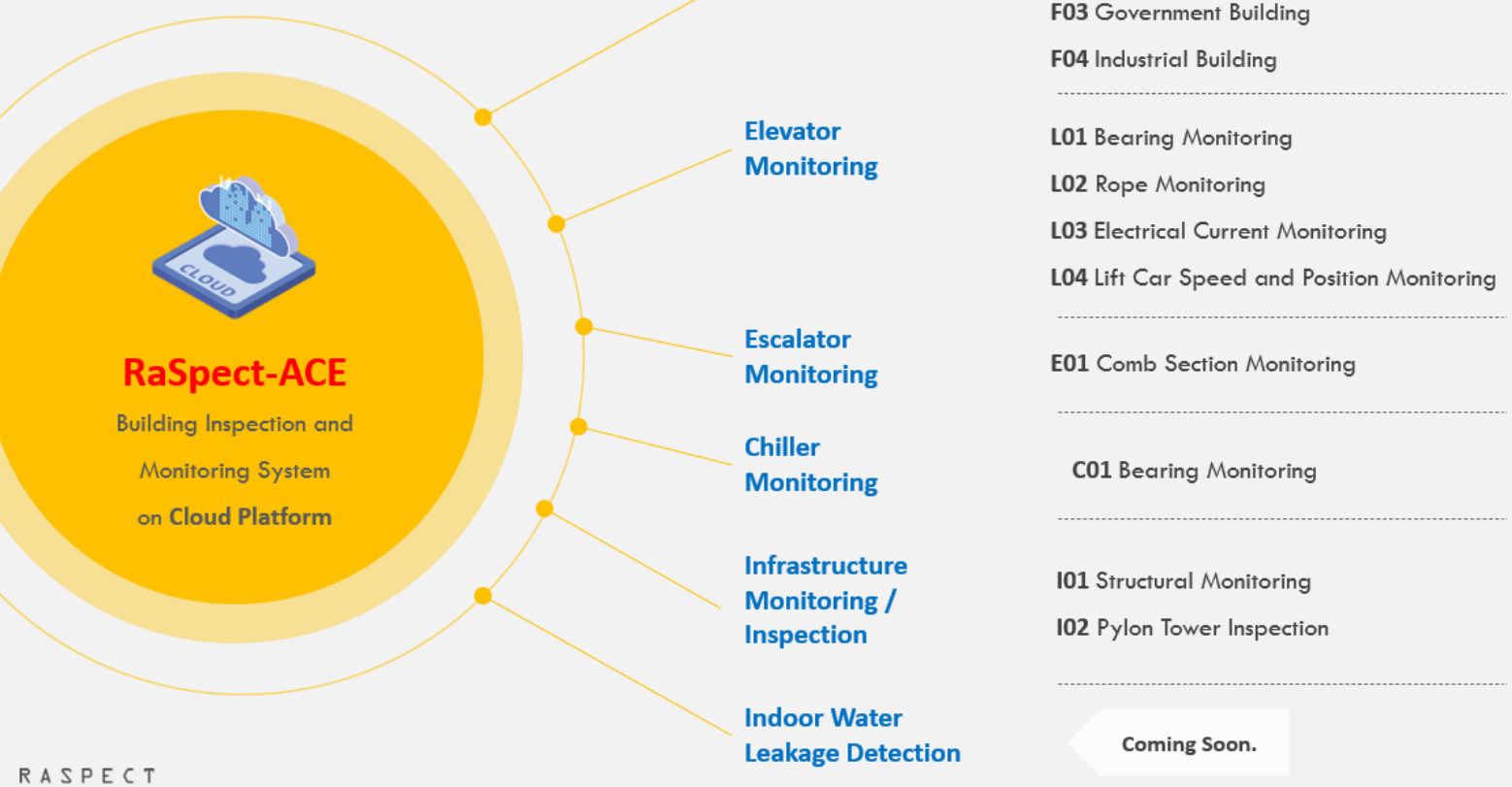
Product Presentation RaSpect-ACE

Applicant: RaSpect Intelligence Inspection Company
Product Name: RaSpect AI Cloud Engine (RaSpect-ACE)
Specification: Cloud based automated inspection platform using AI Analysis and real time IoT monitoring

Core functions: Building inspection and monitoring system on cloud-based platform
Technology used: IoT, AI Analysis, and Big Data Analytics, Cloud Platform
Construction process involved: Construction and post-construction inspection
Key improvement in construction process: Productivity, Quality, Safety and Environmental



Job Reference:

1. Ontolo New Building Inspection, Pak Shek Kok, Adoption 2020
2. Hong Kong Electric Substations Building Inspection, Pok Fu Lam & Shau Kei Wan, Adoption, 2019

Innovative Features RaSpect-ACE

Core Technology: RaSpect AI Cloud Engine (RaSpect-ACE) web-based platform for building inspection and monitoring
First Launch Date: October 2019
Latest Version Launch Date: August 2020

	RaSpect-ACE	Current Practice	Pre-approved products and competitors
Technology	Cloud platform conducts objective AI analysis of building condition from data capture using UAV. IoT monitoring allows for real-time inspection with no downtime.	Traditional inspection requires scaffolding, has high labour costs and is prone to human error. Thermal inspection by hand held device from ground floor Equipment (e.g. elevators) must be taken offline to inspect.	Pre-approved list has IoT sensing for remote monitoring in various construction phases.
Specification	Cloud based automated inspection platform using AI Analysis and real time IoT monitoring	Manual inspection, working a heights, hand held thermal imaging from ground	IoT sensing for remote monitoring
Benefits	Scaffold free building inspection – eliminates the risk of working at height At least 50% cheaper and faster than traditional methods. Automated AI analysis removes human error and conducts inspection with minimal human effort	Industry standard	Simple, battery powered and adaptable to multiple sensor types, low cost. RaSpect-ACE caters for multi IoT sensing, similar to competitors. There are no other AI analysis for façade nor comprehensive building inspection platforms in the Hong Kong market or on the pre-approved list.

International Awards

Runner-up of Techsauce Global Summit 2018

Winner of World Summit Awards 2019 – in Smart Settlements & Urbanisation

Finalist of Harvard Startup Competition 2018

Winner of Red Herring 2019 Asia Top 100

25 Hottest AI Companies 2018 (CIO Bulletin)

30 Fastest Growing Companies to Watch 2018 (CIO Bulletin)

Regional and Hong Kong Awards

Gold Medal Award Winner of 2nd Asia Exhibition of Inventions Hong Kong 2019

Winner of 2019 Hong Kong Rising Star Deloitte China Rising Star Program

Winner of TechCrunch China Greater Bay Area Conference Cum Regional Final (HK) 2018

Winner of HKTDC Entrepreneur Day Start-up Express

HKU Dreamcatcher Award Winner 2017 (100K funds)

Global Entrepreneurship Week (Hong Kong) Champion 2017

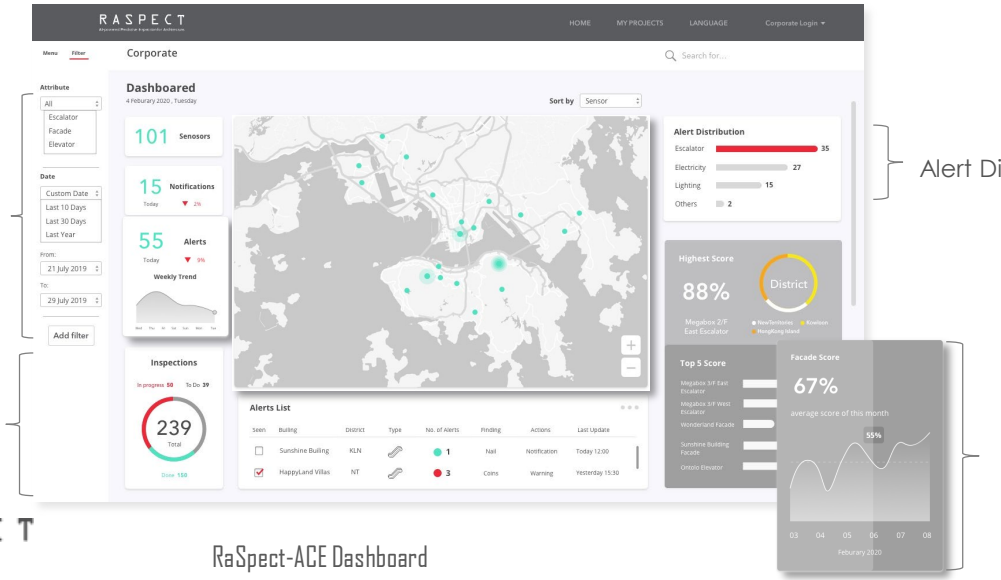
Ontolo New Building Inspection

Client Name	The Great Eagle Company Ltd.
Address	7 Fo Yin Road Pak Shek Kok
Completion Period	May 2020
Work Process	Completed

Use / Function in project

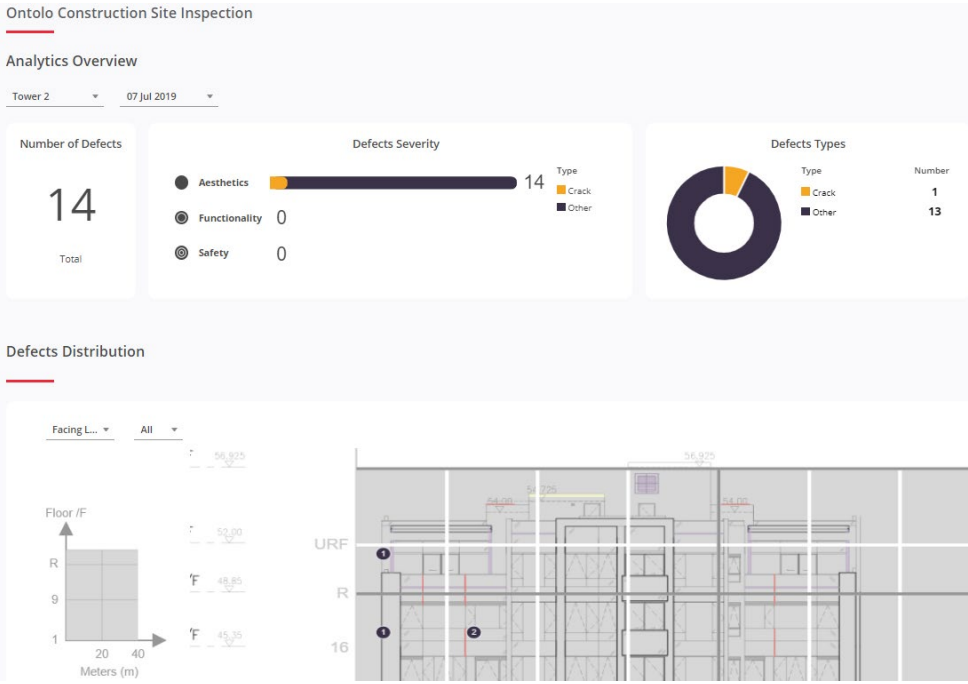
RaSpect provided façade inspection of the newly completed buildings to ensure adequate construction quality and compare as-built with as-designed. Project included:

- UAV survey
- AI analysis for defect identification and condition survey of the new façade and data visualisation on RaSpect-ACE
- Discrepancies between as-design vs as-built were identified by CAD overlay. Milestone completion and project handover was completed based on the inspection results



RaSpect-ACE Dashboard

True-scaled 3D model viewable on RaSpect-ACE



RaSpect-ACE Inspection Analytics Overview

Productivity

RaSpect-ACE provides a platform for comprehensive building inspection using advanced, automated techniques that are efficient and cost effective. Our platform can improve productivity by:

- Save over **50% of cost and time** in the inspection process, e.g. for a typical 30 storey building:
  - Traditional inspection – 1 month
  - Inspection by RaSpect-ACE (including UAV survey) – 2 weeks
- **Eliminate downtime** during equipment inspection:
  - Traditional method – minimum ½ day downtime
  - Real time monitoring using RaSpect-ACE – No downtime
- Rapid **comparison of as-built and as-designed** to ensure the project milestone completion and construction quality

Quality

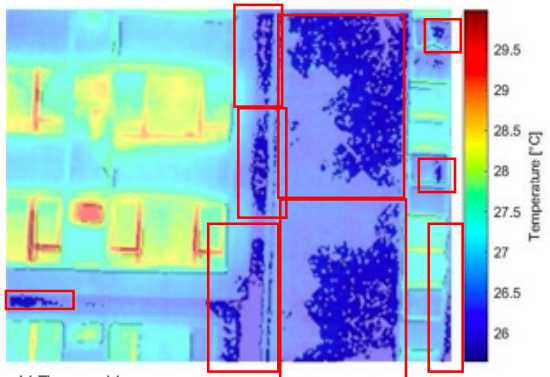
RaSpect-ACE enables **significant quality improvements from traditional inspection** through more regular/real time inspection, reduction in error rate and enabling enhanced data capture:

- **Increase frequency of inspections**, providing better knowledge of building condition and deterioration over time:

	Traditional	RaSpect-ACE
Building façade inspection	Annual	3-months
Critical equipment monitoring	Annual	Real time monitoring

- **Error rate reduction** by using AI for defect identification, removing human error and subjectivity
- Monitoring equipment with IoT sensors provides **real time data** of any detected issues. From this data alerts enable **preventative maintenance** and AI/machine learning **enable predictive analytics** which significantly reduces failure and downtime of the asset
- Enhanced capture of thermal data by UAV. **Thermal images** by UAV capture approximately 10x more thermal images, all perpendicular to the façade, instead of images at ground level only allowing for much better thermal analysis and analytics

Traditional Manual Inspection



AI Thermal Inspection

AI Visual Inspection

Safety

By **reducing or eliminating** the requirement for **human inspection onsite** – especially in unsafe situations such as at heights and in confined spaces:

- **Elimination of working at heights risk**:

Our solution eliminates the need for dangerous working at heights, on scaffolds or gondolas, required in manual inspection

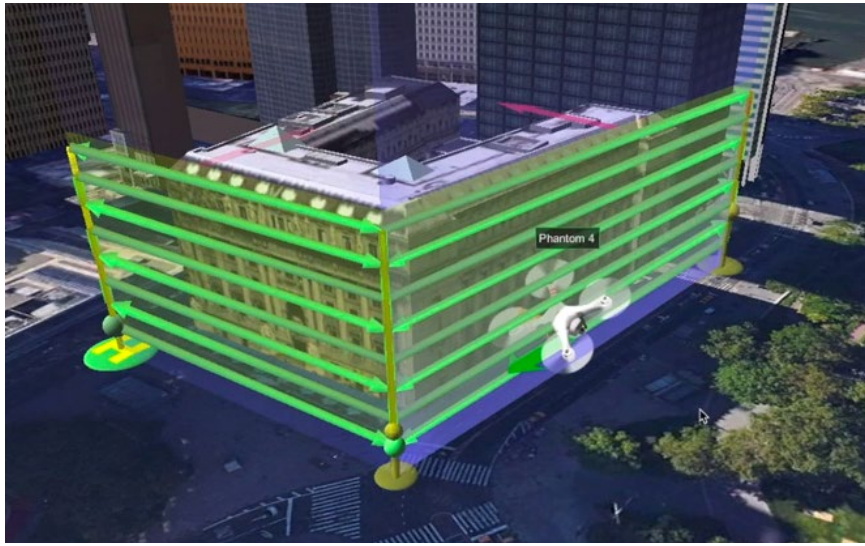
- **Reduce worker time in elevator shaft**:

Our solution automates elevator rope inspection which significantly reduces the requirement for dangerous work in the elevator shaft

- **Reduce failure**:

Real time monitoring of critical systems such as chillers and escalators prevents catastrophic failure by providing early alerts when equipment health declines

Manual scaffolding erection, as required in traditional inspection



UAV flight path demonstration

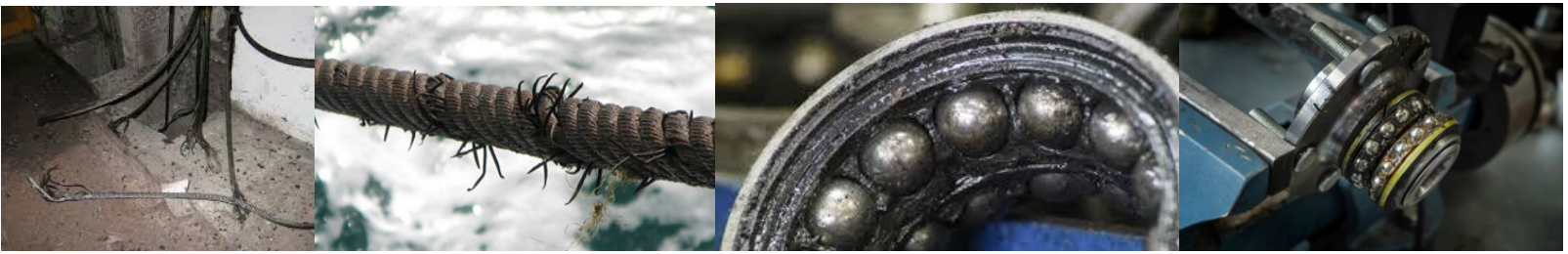
Environmental

Our platform enhances environmental performance in two distinct ways. The first is visual pollution and waste reduction by enabling a scaffold free solution and the second is harnessing predictive analytics and real time monitoring to reduce early asset replacement, reducing material waste:

- **Scaffold free solution:**
  - Reduces unnecessary construction waste during inspection
  - Prevents visual pollution of scaffolding surrounding the building

- **Reduce material wastage of equipment:**

Our AI and real time IoT monitoring can **predict the lifespan of critical systems** such as elevators and chillers and prevent routine replacement of components. Instead, the components are **only replaced at their end of life**.



Ropes, bearings and other critical equipment are only replaced when required ensuring safety and equipment lifespan

Traditional inspection – infrequent inspection can require early replacement of components

Real-time monitoring and defect detection, enables replacement only when health is poor e.g. visual and electromagnetic analysis of elevator rope.