



资产管理与维护协会

Asset Management & Maintenance Association

Advancing Maintainability, Sustainability and Value Chain Integration

增强可维护性，可持续性和价值链整合

CONDITION ASSESSMENT STANDARDISATION IN MAINTENANCE PLANNING

Common Defects in Building Envelopes

12 July 2024, 2 - 5 pm

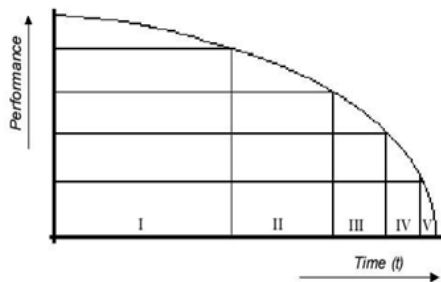
BACKGROUND

Condition Assessment Standardisation

Condition Assessments commonly known as Inspections provide condition data for maintenance planning and timely corrective/repair actions to ensure asset (buildings/infrastructures) functionality and safety for users.

The Asset Management and Maintenance Association (AMMA) promotes standardization in asset condition assessment after Dutch Standard NEN 2767: Condition assessment built environment / CEN TS 17385: Method for condition assessment of immobile constructed assets. The condition assessment protocol promoted in the standards reduces the inevitable subjectivity in visual inspections; adoption of the protocol results in a condition score ranging from 1-6, with '1' being 'As New' and '6' being 'End of Life'.

The protocol and standardized defects classification system enables condition monitoring throughout asset life and is inspector independent. The 1-6 condition scores facilitate data analytics for a better understanding of the impact of increasing defects on component/material degradation and performance, and remaining life.



Condition 1: New Life

Condition 2: 1/2 Life Span

Condition 3: 1/4 Life Span

Condition 4: 1/8 Life Span

Condition 5: 1/16 Life Span

Condition 6: End of Life

Condition Assessment and Condition Scores (After NEN 2767 / CEN TS 17385)

Defects in Building Envelopes

A building envelope is the physical barrier separating the interior of the building from the exterior environment and comprises basement walls, external walls/facades, roofs, windows and doors. They are exposed to the environment and are more prone to defects. As facades are often inaccessible, drones are needed to support the condition assessment process.



Building Envelope Generated by AI
(Credit: Ar. Luther Seet, Inully Ltd, London)

Delay in repairs to envelope elements such as external walls/facades and windows can impact safety of building users. Asset owners are advised to carry out periodic condition assessments of elements of their building envelope elements to determine asset ageing, defects and plan for timely repairs and eventual replacements.

OBJECTIVES OF SEMINAR

The seminar provides feedback on common defects found in regulated and routine building envelope condition assessments carried out by PEs, Architects, Facade Inspectors and Certified Building Inspectors who are all members of the Asset Management and Maintenance Association (AMMA).

PROGRAMME

Opening Address by Chair of Seminar

Seminar Chair: [Ar. Luther Seet](#)

Luther Seet a registered Architect has over 16 years of industry experience. He has led small and large scale architectural projects in Singapore, Spain, Vietnam, India and Indonesia. Some of these notable projects are Terminal 4 Changi Airport, National Gallery of Singapore, Mount Elizabeth Novena Hospital and Han Jardin in Hanoi. He founded Singapore-based architectural practice al+ LLP and London based Inully Limited in 2017; his first residential project was featured in Tatler Homes and Channel News Asia's remarkable living series for design excellence. Luther received the Tatler Design Awards in Feb 2020 for best tropical design, and another award in 2022 for firms on the rise with recognition for his Eco-conscious focus on projects. He lectures in Sustainable Construction, Life Cycle Costing, and Universal Design in Singapore University of Social Sciences and design studio in the school of design and environment in Ngee Ann Polytechnic.

Presentations

1. Condition Assessments of Buildings

- Condition Assessments in Maintenance Planning
- Subjectivity in Visual Inspections
- Visual Condition Assessment Standardisation / NEN 2767 & CEN TS 17385

Speaker: [Dr Quah Lee Kiang, FRICS](#)

Dr Quah is the Director of the Real Estate & Construction Centre and the Real Estate & Construction Academy in Singapore. She has extensive regional and international experience in Project and Facilities Management & Maintenance research, advice and academia. Her professional affiliations include being past President of the Chartered Institute of Building Singapore Centre. She was also a member of the Royal Institution of Chartered Surveyors (RICS) Asia Board, Singapore Board and Asia Pacific Sustainability Board.

2. Building Facades: Condition Assessment & Common Defects

- Structural Facades
- Facades Associated with Framed Buildings
 - Infill Panel Walls
 - Claddings
 - Curtain Walls

Speaker: [Er. Richard Tai](#)

Er.Tai has a background in façade and structural engineering. He specializes in the design, engineering, assessment, construction, procurement and project management of building envelope systems. He has 25 years working experience in the façade industry and is currently an Associate with Arup Singapore Pte Ltd. He had an earlier career in Dragages Singapore and Permasteelisa Holdings.

3. Basement Walls & Roofs: Condition Assessment & Common Defects

- Reinforced Concrete Basement Walls
- Roof Structures and Finishes:
 - Pitched Roofs: Roof Structure: Timber and Structural Steel
Roof Finishes: Clay Tiles and Metal Sheeting
 - Flat Roofs: Roof Structure: Reinforced Concrete and Structural Steel
Roof Finishes: Bituminous Felt and EPDM Finishes.

Speaker: [N. Peru, MCABE](#)

Mr Peru is a Chartered Building Engineer and Director of Pre-Empt Building Surveyors Pte Ltd. He has more than 20 years of experience in the built environment specialising in, design, installation and project management of waterproofing systems for infrastructure and building projects in Singapore and 15 other regional countries. He had an earlier career at Hitchins and provided technical support to 11 LTA MRT stations using deep tunnelling waterproofing systems. He was also responsible for setting up technical training and supervision procedures for the training of waterproofing applicators in Singapore and the region.



4. Condition Assessments by Unmanned Aircraft Systems (UAS)

- Overview of Condition Assessment Process
- Interpretation of Data and Deploying AI for Predictive Maintenance
- Limitations of UAS Condition Assessments

Speaker: Er. Shi Xiang

Er Shi leads the façade inspection with drone and AI technology at Singapore Inspection & Engineering Pte Ltd (SIE). SIE is accredited by SAC as an Inspection body (IB) for building façade inspection using unmanned aircraft systems (UAS). Er Shi has carried out 75 drone inspections for residential, commercial and industrial buildings working with Kevin Chang, a BCA/IES trained Façade Inspector. He also works on inspection software development for building inspection and carries out building inspection with advanced NDT. He had an earlier career at BCA, a consultancy practice and with contractors.

SEMINAR DATE & TIME

12 July 2024 Friday
2 pm to 5 pm. Registrations starts at 1.30pm.

SEMINAR FEES

AMMA Members: Free All Others: \$100
Please contact Gary Law / Edith Yap (details provided below for information on AMMA membership)

SEMINAR VENUE

Rooms 01-01, 01-02 & 01-03
Level 1 Devan Nair Institute for Employment & Employability
80 Jurong East Street 21
Singapore 609607

ENQUIRIES ON AMMA MEMBERSHIP & REGISTRATIONS

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Upholding a Standard of Excellence in Asset Life Cycle Management and Value Chain Integration

Advancing Maintainability and Sustainability in Preserving and Reducing Embodied Carbon in Asset Maintenance & Refurbishment

Promoting Standardisation and Best Practices in Asset Condition Assessment in Furtherance of Predictive Maintenance

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