



Jointly organized by:



Maritime and Port
Authority of Singapore



NANYANG
TECHNOLOGICAL
UNIVERSITY
SINGAPORE

Nanyang
Technological
University Singapore

WORKSHOP ON RIGID INCLUSION FOUNDATION SYSTEM FOR CONTAINER YARD

Introduction of "Guideline for Rigid Inclusion Foundation
System for Container Yards"

Held at: Maritime and Port Authority of Singapore
mTower Building, 460 Alexandra Road,
Level 18, Excellence Room

Date: **1 February 2024**
Time: **0900 to 1200**

Prior registration preferred
Briefing Room limited to 80pax.
Closing date for registration: 29 January 2024

PDU and STU points pending.

9.30am - 9.45am

- Opening by Er. Tham Wai Wah
Senior Director / Chief Engineer
(Engineering & Project Management) |
Chief Sustainability Officer (Maritime
Decarbonisation)
MARITIME AND PORT AUTHORITY OF SINGAPORE

9.45am - 10.30am

- Introduction of Rigid Inclusion (RI)
- Briefing on RI R&D project carried out
- Benefits of RI (construction and
costs)
- Design and analysis

10.30am - 11.00am

- Pilot test – installation,
instrumentation, results

11.00am - 11.15am

- Guideline for Rigid Inclusion
Foundation System for Container
Yards

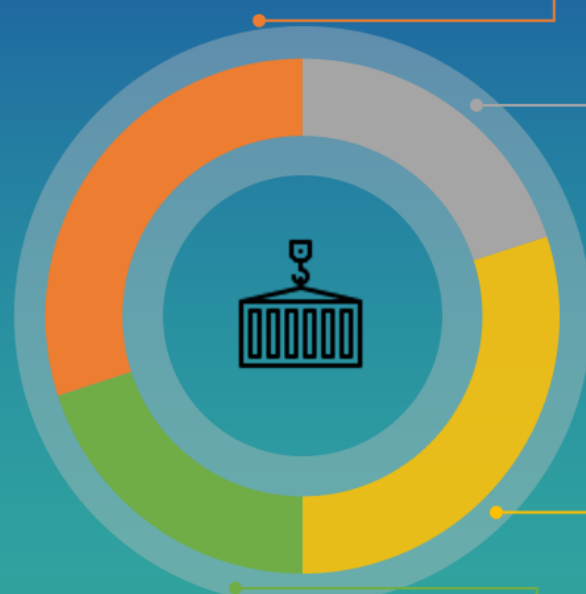
11.15am - 11.20am

- Closing Remarks

11.20am - 12.00pm

- Q&A

Value-Creation of New Foundation System



Reduce construction time

Facilitate future
redevelopment

Save construction cost
substantially

More environmentally
friendly

REGISTRATION LINK



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Technical Information for the construction industry on the use of Rigid Inclusion foundation system for the construction of future container ports.

The design guideline for the rigid inclusion foundation system was also collaborated and supported by the Building and Construction Authority for implementation in Singapore in 2024.

Synopsis

Reinforced concrete (RC) piles have been used as the foundation for container yards in Singapore and many other countries. However, RC piles are difficult to be demolished in the future and are not necessarily the most cost-effective design.

A new foundation system using a load transfer platform and non-reinforced rigid inclusion columns was investigated. 3D finite element analyses (FEA) have been carried out to predict the performance of the new design followed by pilot test carried out at Tuas Port Phase 1.

All the results obtained have met favorably the design and the numerical procedure adopted. In this workshop, the principle behind the proposed design and the design method will be explained. Videos of the rigid inclusion foundation installation and load tests will be shown and explained. The results from the pilot tests and the 3D finite element analyses will be presented.

Research Institution:



Nanyang Technological University
Singapore

Collaborators:



PSA Corporation limited



Maritime and Port
Authority of Singapore

Supported by:



Singapore Maritime Institute



Engineers 9000 Pte Ltd

Pilot Test by:



Menard Geosystems
Singapore Pte Ltd



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