

CREATING A MARINE CLAY MATRIX WITH INCINERATION BOTTOM ASH (IBA) FOR LAND RECLAMATION

Project Scope

Objectives

To develop a novel integrated engineered system using IBA-marine clay formulations for land reclamation

Value Proposition

- Use of IBA and marine clay to significantly substitute imported sand as the primary fill in land reclamation
- Practical solutions with time-, energy- and cost-savings
- Provide a platform for further R&D works on the transforming Incineration Fly Ash (IFA) for reuse

Description

Module 1	• Develop chemical additives to stabilise the IBA
Module 2	• Study the use of marine clay to encapsulate the stabilised IBA • Study the pozzolanic and other properties in the IBA-marine clay mixture
Module 3	• Develop a 3D non-linear finite strain (NFS) consolidation model of the mixture • Predict leaching potential and consolidation process of the mixture
Module 4	• Investigate the use of marine clay and liner thickness as additional liner to prevent potential leaching
Module 5	• Study the long-term stability of the mixture
Completion	• Integration of above into a complete engineering system for land reclamation using IBA and marine clay

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Brief Background



Scope of Project

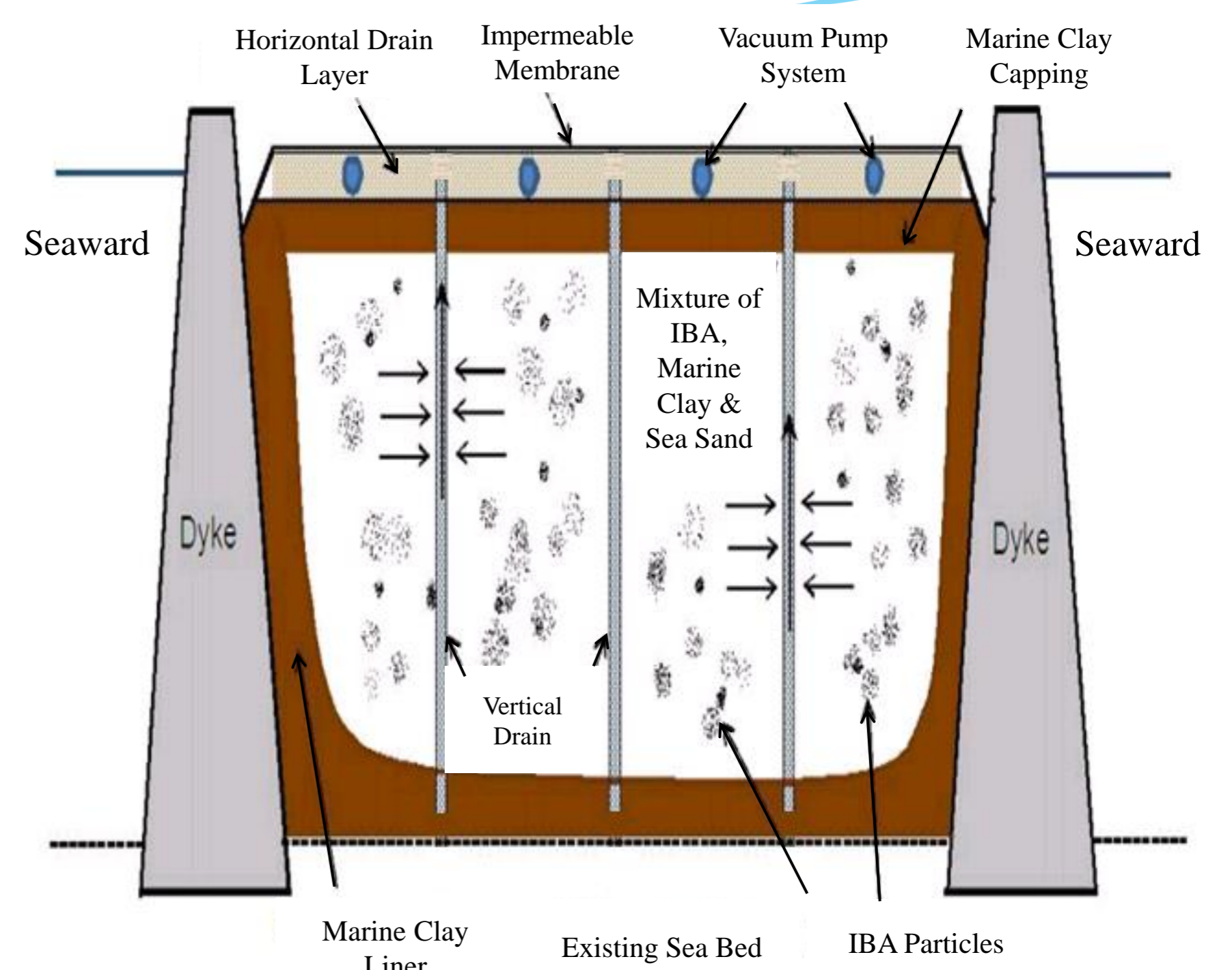


Contributions to Singapore's Environmental Sustainability

- To transform IBA into "Singapore New Sand" which will reduce its dependence for importing raw materials for land reclamation.
- Assist NEA to achieve its vision of "Towards Zero Landfill & Zero Waste".
- To develop an engineering technology to transform two waste materials-IBA and marine clay into valuable civil construction resources for land reclamations in both Singapore and exportable to other coastal countries.

Key Deliverables

Treatment technologies for IBA	• Leachate compliance • Enhancing the self weight consolidation of the IBA-marine clay
IBA-marine clay formulations	• Appropriate chemical and physical properties
NFS consolidation system	• Higher accuracy of mechanical and chemical modeling
Capping and liner system	• Minimising leaching
Integrated engineering system	• Complete engineering system for land reclamation using IBA and marine clay



* Drawing not to scale

Illustration Diagram of Land Reclamation

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