Boskalis

PROJECT SHEET

HARBOR CITY RECLAMATION PROJECT
SOIL IMPROVEMENT CONTRACT

BOSKALIS

Boskalis is a leading global marine contractor and services provider. With safety as our core value, we offer a wide variety of specialist activities to the oil & gas and renewables sectors. These activities include marine installation and decommissioning, seabed intervention, marine transport and services, subsea services and marine survey. In addition, Boskalis is a global dredging contractor, provides towage and terminal services across the globe and delivers marine salvage solutions.
By understanding what drives our Clients we are able to provide the solutions that enable them to meet their specific business goals. For this reason we are constantly looking for new ways to broaden and optimize our offering and are committed to expanding our proposition, supported by our financial strength. With our committed professionals in engineering, project management and operations, 500 specialized vessels and an unprecedented breadth of activities in 90 countries across six continents we help our Clients push boundaries and create new horizons.

INTRODUCTION

Following the successful delivery of the Harbor City Reclamation Project, Boskalis was engaged by Pasay Harbor City Corporation under a dedicated Soil Improvement Contract to undertake advanced ground improvement and platform preparation works across Island A and Island B.

The program represented the transition from land creation to land development, requiring the reclaimed platforms to achieve the geotechnical performance necessary to support future residential, commercial, and public infrastructure. Boskalis delivered an integrated solution combining specialist ground improvement, geotechnical engineering, survey, verification testing, and dry earth movement operations.

The works were executed jointly with Cofra B.V., the ground improvement specialist of Royal Boskalis, through a fully integrated delivery model.

Beyond execution of the physical works, Boskalis provided proactive engineering and technical advisory support to the Client. Through continuous interpretation of geotechnical data, evaluation of ground behaviour, assessment of platform stability, and technical review of treatment methodologies, the project team informed decision-making throughout execution.

FEATURES

Client	Pasay Harbor City Corporation
Service Provider	Boskalis Philippines, Inc.
Specialist Ground Improvement Expertise	Cofra B.V., the ground improvement specialist of Royal Boskalis
Location	Pasay, Metro Manila, Philippines
Period	June 2025 - April 2026
Duration	11-month multi-phase ground improvement program
Major Equipment	Spread 3 vibro-compaction rigs operating in tandem configurations, 2 PVD installation spreads, 1 Cofra Dynamic Compaction rig, and an extensive Dry Earth Movement fleet
Scope	Ground improvement and platform preparation works across Island A and Island B
Key Services	Prefabricated Vertical Drains, Vibro Compaction, Cofra Dynamic Compaction, Dry Earth Movement, Geotechnical Verification and Technical Advisory Services

A Vibro Compaction works in tandem rig configuration.

The project demonstrates Boskalis' ability to integrate engineering expertise, specialist ground improvement technology, and operational execution into a single delivery model capable of addressing technically demanding reclamation developments.

SCOPE OF WORK / PROJECT EXECUTION

The Soil Improvement Contract comprised a comprehensive program of soil improvement and platform preparation activities across Island A and Island B. The works were executed using a substantial specialist equipment spread comprising three vibro-compaction rigs operating in tandem configurations, two PVD installation spreads with dedicated pre-drilling capability, one Cofra Dynamic Compaction (CDC) rig, and an extensive Dry Earth Movement (DEM) fleet. This integrated spread provided the flexibility and production capacity required to support multiple work fronts across the reclamation areas.

The scope combined Prefabricated Vertical Drain (PVD) installation, Vibro Compaction (VC), Cofra Dynamic Compaction (CDC), and Dry Earth Movement (DEM) works. Activities were delivered through a phased execution strategy allowing construction sequencing to align with evolving development priorities and site readiness.

Execution was supported by extensive geotechnical investigations, Cone Penetration Testing (CPT), Seismic Cone Penetration Testing (SCPT), topographic surveys, and continuous performance monitoring. The integration of engineering, survey, and operational teams enabled treatment methodologies and execution parameters to be optimized in response to varying ground conditions while maintaining a robust verification regime.

The project demonstrated Boskalis' capability to deliver large-scale ground improvement programs under evolving operational conditions while maintaining technical control through a data-driven approach to execution.

B Installation of Prefabricated Vertical Drain (PVD).

NINA

The project was delivered under Boskalis' NINA (No Injuries, No Accidents) program, integrating safety leadership, workforce engagement, and proactive risk management into all stages of execution.
A structured framework incorporating Permit to Work systems, Job Hazard Analysis, pre-start meetings, YES Scans, and Stop Work Authority was applied across all activities. Particular focus was placed on platform stability, heavy equipment operations, simultaneous operations, traffic management, and line-of-fire risks associated with soil improvement activities.

Safety was further strengthened through close integration between engineering and operations. Geotechnical assessments, platform stability evaluations, and controlled workfront sequencing contributed to a Safety by Design philosophy that reduced operational risk while maintaining production efficiency.

Through disciplined implementation of safe working practices and strong workforce engagement, the project achieved an excellent safety record and was completed without Lost Time Injuries.

ENVIRONMENTAL AND SOCIAL

Environmental management was embedded within project execution through a structured framework focused on compliance, prevention, and continual improvement.

Activities were supported by accredited waste management systems, dust suppression measures, environmental inspections, and routine monitoring programs. Waste streams were managed through approved service providers in accordance with applicable regulations, while operational controls were implemented to minimize environmental impacts associated with earthworks and ground improvement activities.

The project operated within a heavily regulated reclamation environment and maintained a strong environmental performance throughout execution. No community grievances associated with the Service Provider's activities were

recorded during the Soil Improvement Contract. Beyond project requirements, Boskalis continued its commitment to environmental stewardship through sustainability initiatives including mangrove planting activities supporting coastal ecosystem rehabilitation.

QUALITY

Quality management was implemented through a structured framework aligned with the Boskalis Way of Working and internationally recognized quality management standards.

The quality philosophy relied on clearly defined execution parameters, continuous operational monitoring, geotechnical verification, and a structured inspection process. Survey, engineering, and operational data were continuously reviewed to confirm compliance and support informed decision-making during execution.

Ground improvement activities were verified through a combination of CPTs, SCPTs, survey control, and formal inspection processes. This approach ensured transparency between the Service Provider and Client while providing confidence in the achieved treatment performance. The project achieved a strong quality record, demonstrating the effectiveness of Boskalis' management systems, technical controls, and commitment to accountable project delivery.

SOIL IMPROVEMENT

Soil improvement works were executed across Island A and Island B through the combined expertise of Boskalis and Cofra B.V., the ground improvement specialist of Royal Boskalis. The objective of the program was to improve the performance of the reclaimed platforms by accelerating consolidation of the underlying marine soft clay deposits, densifying the reclamation fill, and mitigating liquefaction-induced deformation under the project's seismic design requirements.

The treatment methodology combined PVD, VC and CDC, supported by an extensive program of geotechnical investigation, survey control, CPT, and SCPT. Pre-treatment CPTs were used to characterize the reclamation fill and underlying strata, establish PVD termination criteria, and determine vibro-compaction penetration levels. Post-treatment SCPT verification testing was performed to assess densification performance and liquefaction resistance.

PVD installation accelerated consolidation of the underlying soft clay deposits and reduced future settlement. Vibro Compaction formed the principal densification methodology for the reclamation fill

and was executed using Cofra B.V.'s tandem vibro-compaction configuration. Operational parameters were continuously evaluated against geotechnical conditions and verification data to optimize treatment performance while maintaining production efficiency.

A key engineering challenge was the highly variable nature of the reclamation fill, comprising hydraulically placed sand fill together with imported volcanic materials exhibiting varying fines content, density characteristics, and penetration behavior. These conditions required continuous geotechnical assessment and close integration between engineering and operations to optimize treatment methodologies and maintain reliable performance verification.

Cofra Dynamic Compaction was applied to densify the upper reclamation layers above the vibro-compaction treatment horizon, creating a more uniform and robust compacted crust while improving near-surface platform performance. The combined VC and CDC treatment strategy provided a continuous improvement profile through the reclamation fill and enhanced constructability for future development activities.
Beyond execution, Boskalis provided ongoing technical advisory support to the Client, including CPT and SCPT interpretation, assessment of liquefaction performance, platform stability evaluations, development of operational parameters, and independent technical review of ground improvement strategies. Engineering decisions were therefore informed by measured ground behavior and site-specific performance data throughout the program.

The project demonstrated the value of integrating Boskalis' geotechnical engineering capability with Cofra's specialist ground improvement expertise, delivering a technically robust and performance-driven ground treatment program under challenging reclamation conditions.

DRY EARTH MOVEMENT

Dry Earth Movement activities formed an integral component of the overall ground improvement strategy and were essential in enabling access, platform stabilization, treatment sequencing, and achievement of target development levels.

The works involved the strategic redistribution of fill material across the reclamation platforms to support PVD installation, Vibro Compaction, Cofra Dynamic Compaction, and access to Client-designated priority areas.

C Dry Earth Movement operations enabling ground improvement activities.

Continuous topographic survey control was used to monitor platform development, verify placement levels, and support construction planning.

Particular emphasis was placed on maintaining stable working platforms for heavy tracked equipment operating on variable reclamation fill. Earthworks were therefore closely integrated with geotechnical assessments, platform stability evaluations, and soil improvement activities, enabling safe and efficient progression of the works.

Through detailed planning, survey control, and innovative placement methodologies, Boskalis successfully aligned earthworks execution with the evolving requirements of the ground improvement program and the Client's development objectives.


D

FLEXIBLE COMMERCIAL AND DELIVERY FRAMEWORK

The Harbor City soil improvement program was enabled through an innovative contractual and commercial framework developed to support the phased execution of the works. The Soil Improvement Contract combined secured funding arrangements and robust payment safeguards with a flexible, time-based execution model. This provided the certainty required to mobilize specialist Boskalis and Cofra B.V. resources while allowing activities to be adapted to changing workfront availability, ground conditions and development priorities. By aligning funding commitments with project execution, the framework supported continuity of the works and enabled the Client to advance the reclamation platforms in line with its wider development program. The approach demonstrates Boskalis' ability to integrate commercial flexibility, specialist ground improvement expertise and operational delivery within a bankable project structure.

OUTCOME

The Harbor City Reclamation Project - Soil Improvement Contract successfully delivered a comprehensive program of ground improvement and platform preparation works supporting the next phase of development of the Harbor City reclamation.

The project demonstrated Boskalis' ability to combine specialist ground improvement technologies, advanced geotechnical engineering, rigorous verification methodologies, and efficient construction execution within a single integrated delivery model. Working under challenging ground conditions and evolving development priorities, the project team consistently delivered practical engineering solutions supported by measured performance data.

A key factor in the project's success was the integration of Cofra B.V., the ground improvement specialist of Royal Boskalis, whose proprietary technologies and international experience strengthened the technical delivery of the works. The combination of Boskalis' engineering and project delivery capabilities with Cofra B.V.'s specialist expertise provided the Client with a single integrated partner capable of delivering both technical assurance and specialist execution.

Beyond the physical works, Boskalis provided proactive engineering consultancy and technical advisory services supporting geotechnical assessment, performance verification, platform stability, and ground improvement optimization. This collaborative approach assisted the Client in making informed technical decisions while maintaining focus on long-term development objectives.

The Harbor City Reclamation Project - Soil Improvement Contract stands as a strong reference for Boskalis in the field of large-scale reclamation ground improvement, demonstrating technical excellence, operational adaptability, and the successful integration of engineering expertise with specialist ground improvement technologies.


E

D Cofra Dynamic Compaction (CDC) works.
E Cone Penetration Testing (CPT) performed for geotechnical verification and quality control.

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