Main Gate Assessment and Repair Study

Owner	Pharaonic Petroleum Company (PhPC)
Client	Pharaonic Petroleum Company (PhPC)
Location	West Harbour, Port Said, Egypt
Year / Status	2025 / Successfully Delivered
Project Type	Assessment and Feasibility Study
Keywords	Structural Integrity, Restoration, Repair Methodology, Lifecycle Assessment

Scope of Work

UNEPP was commissioned by PhPC to perform a structural inspection and evaluation of existing gate concrete elements using Non-Destructive and Semi-Destructive Testing to assess concrete strength, reinforcement condition, and corrosion risk. The testing scope included core extraction, steel detection, half-cell potential, carbonation depth, and chemical analysis for chlorides and sulfates. Based on results, UNEPP prepared a detailed report with repair and strengthening recommendations, developed method statements with materials and drawings, and issued cost and execution plans for the selected option. This was later followed by a feasibility study to evaluate adopting a steel structure alternative.

Technical Challenges

- Severe concrete cracking, spalling, and reinforcement corrosion from marine exposure and chloride ingress.
- Concrete compressive strength below ECP 203-2020 limits, requiring major structural intervention.
- Difficult access for inspection, concrete removal, and rebar treatment without further damage.
- Ensuring bond integrity, corrosion protection, and compatibility between new and existing materials.
- Maintaining architectural consistency and minimizing operational disruption during restoration or replacement.

Execution Strategy

Restoration options involved localized concrete removal, reinforcement cleaning, epoxy coating, bonding agent application, and concrete jacketing under temporary supports, followed by curing and monitoring. For new construction, modular prefabrication—especially for the steel option—minimizes site disruption, enabling faster erection (≈8 weeks) and improved quality control through offsite fabrication

Strategic Outcome

The study enables PhPC to make an informed decision on the optimal long-term solution for the West Harbour Main Gate. It confirmed that restoration offers short-term savings but limited service life, while new concrete or steel gates ensure extended durability, lower maintenance, and improved lifecycle value, guiding future investment and sustainability planning.

Photos / Diagrams